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A MODIFIED TECHNIC FOR THE COMBINED OPERATION OF EXTIRPATION OF THE RECTUM.

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Without retracting anything which I have heretofore said in favor of the perineal operation for extirpation of the rectum, I wish to record my concurrence in the universal opinion of surgeons that theoretically the combined operation is the operation of choice for the extirpation of the rectum in any condition requiring the removal of more than the lower four to five inches of this organ. Its hitherto high mortality, and the fact that many operators have made the artificial anus a necessary accompaniment of this operation are the only arguments against it. That the latter objection is no longer tenable will be shown by the recent writings of Lusk, Hartmann, and many others, together with my own reports of two years ago (*New York Medical Journal*, September, 1908). As to its high mortality, this is steadily decreasing, until today it is less than that of the perineal operation 10 years ago.

The death of Mr. ——, 1898, due to gangrene of four inches of the gut, after tearing off the superior hemorrhoidal artery just below the promontory of the sacrum showed me that when the severance of this artery is necessary one should either drag the sigmoid down three or four inches below the recto-sigmoidal juncture by dissecting from below, or, if this is impossible, open the abdomen and do so from above, until a section with good circulation is found. Since I have practiced closing the anal aperture before beginning extirpation of the rectum, every death and all protracted recoveries from the perineal operation have come from gangrene, due to imperfect circulation, rather than from infection, with one exception, in which death was due to suppression of urine from chronic nephritis. These deaths have not been many, but they have excited a close study of the circulation of these parts, and have revised my methods to a large extent.

Blank Space in Anastomotic Circulation of the Sigmoid. A study of the circulation of the sigmoid and rectum shows a space, of variable length, about the recto-sigmoidal juncture which is very sparsely supplied with bloodvessels, and without any apparent anastomotic connections. (Figs. A and C.) All the gut below this is supplied by the superior hemorrhoidal artery, the terminal branches of which run directly downward and anastomose with each other, but not with the sigmoidal branches above. This is clearly shown in the dissection made for me by Hopkins, and published in my work on Rectal Diseases, in 1902, (Fig. A); also by the dissections of de Dietrichs, made for Hartmann, and published in his recent article in the *Annals of Surgery*, December, 1909.

It is therefore clear that if this vessel is cut above its distribution to the rectum, and the gut is amputated below that part which is well supplied by the sigmoidal artery, all that portion between the point of amputation and the point of the sigmoidal blood supply will have practically no blood supply; it will consequently slough and retract, leaving a large suppurating cavity, or it will cause death if the slough goes above the peritoneal floor.

In the perineal operation it is almost impossible to tell, until one has cut off the gut, whether the blood supply is sufficient or not; and, as it is necessary to work by feeling alone up in a deep cavity, one *may* tear off or cut off the very branches which will contribute to the result he is seeking. The problem before us then is how to provide for a proper circulation in the proximal end of the gut, without taking away an unnecessary amount of the intestine above the tumor.

By the perineal, sacral, or vaginal routes this can be accomplished only by clamping the superior hemorrhoidal artery and then incising the peritoneal supports until a portion of the sigmoid with good circulation is brought down. The amount of gut that can be amputated is indefinite, and it is always experimental, for one can never tell the length or condition of the meso-sigmoid, or the possible attachments or adhesions of the gut above, which latter may render it impossible to bring the gut down sufficiently to meet the requirements. I attempted the operation in one case in which, owing to the adhesions, it was impossible to bring the gut down

more than four inches, and had to resort to the abdominal operation, with an artificial anus.

While I have had good results from the perineal operation, both as to mortality and cures, I have never shut my eyes to the above objections; and I have about concluded that for tumors where more than four inches are to be amputated the combined operation is to be preferred, for the following reasons:

1st: It affords an opportunity to examine the abdominal organs, the glands, and the peritoneum with regard to metastases. If these exist the extirpation is not justifiable, and only a palliative operation—such as *curettage,* or an artificial anus, should be employed.

2nd: It enables one to ascertain how high the growth or stricture extends; to determine the length of the meso-sigmoid at divers points and to select a segment with a good blood supply that can be brought down to the anus without tension.

3rd: It enables one to tie the superior hemorrhoidal artery at a point above its anastomosis with the sigmoidal artery, and thus preserve a good blood supply to the rectum, as has been so happily described by Hartmann. (Fig. 1.)

4th: It enables us to clean out all tre glands in the internal iliac angle, and from there down more perfectly than by the perineal method.

5th: By it one can cover up denuded surfaces, and close up the peritoneal cavity before opening the bowel and perfectly restore the meso-sigmoid which prevents both retraction and prolapse.

6th: It enables one to retreat and resort to an artificial anus if the conditions do not warrant total extirpation, or if the length of the sigmoid does not permit the fecal exit to be restored to the anus.

The methods employed until recently consisting in selecting a point a short distance above the tumor, tying off the bloodvessels *en masse,* as one loosened the gut from its attachment to the sacrum regardless of their anastomotic relations, have, in my own mind, failed simply because of the insufficient and indefinite blood supply to the proximal end of the gut, and to the large denuded surfaces left in the peritoneal cavity after such extirpations. The technic which I have employed for the past three years avoids these objections, and is now published for the first time, after a fairly large experience (eleven cases), in such an operation. It differs from that lately published by Lusk in the treatment of the peritoneum, the restoration of the meso-sigmoid, in the bloodvessels tied, and in the treatment of the ends. It differs from that of Hartmann (op. cit.), in the same respects except as to the ligation of the bloodvessels; in all this we follow the same lines. My technic is as follows:

Preparation of Patient. This, while considered one of the most important features, will not be detailed here as I have published it several times elsewhere. It consists in dietary, systematic purging, internal irrigations, internal disinfection, abdominal toilet, and rectal toilet just before operation; the last is so important, however, that I must mention it. It consists in irrigating the rectum with a 3% (one teaspoonful to a quart), solution of formalin, wiping this out and then injecting two or three ounces of pure peroxide of hydrogen up into the rectum and above the tumor if possible, just before the operation, in order to thoroughly sterilize the parts in case one should find it necessary to introduce the finger into the bowel or to perforate it in order to secure invagination, as will be described later on.

The patient is placed in the Trendelenburg posture; a lineal incision is made just outside of the left rectus muscle, beginning just below the navel and extending almost to the pubes, avoiding, if possible, the inferior epigastric vessels. The abdomen having been opened the abdominal cavity is examined for lymphatic or metastatic involvement; the site and extent of the tumor are observed and its attachment to the other pelvic organs. An adhesion to other pelvic organs does not always mean a malignant involvement; some of the best results that I have obtained have been in cases where the bladder and prostate have been attached to the tumor; and enlarged lymphatics do not always mean involvement in the pathologic process; I have often taken these out and found them to be nothing more than an inflammatory infection. If the uterus and appendages are involved even by adhesions, I believe it is well to remove them and I have practiced taking them out at once before beginning operation upon the rectum; it gives one more room for work and adds little time to the operation.

Treatment of the Meso-Sigmoid. Having determined the above facts, and the extent of the tumor, one selects a point in the sigmoid two inches further above the tumor than the latter is above the anus, thus allowing a leeway of this amount in bringing the sigmoid down to the natural fecal exit. A small incision is then made in the peritoneal layer of the meso-sigmoid about one-half inch from the margin of the gut; a thin spatula-like director is slipped into the incision, and with this as a guide, the peritoneum is incised parallel with the gut down to the tumor; the gut is then turned over to the other

side and this process is repeated. The peritoneum is then stripped back on either side to its attachment on the posterior abdominal wall (Fig. 2); these attachments having been cut loose it enables one to drag the cut much higher out of the wound and facilitates ligating the bloodvessels and removing the glands. With the gut thus dragged up, one teases the fat and glands off the bloodvessels always toward the gut until the lower sigmoidal artery is found and traced to its origin in the superior hemorrhoidal. The latter is then tied and cut between the two ligatures, just *above* the lower sigmoidal, which point is usually just below the promontory of the sacrum, and in the angle of the iliac vessels. (See Figs. 1, 2 & 3.*) This provides for the anastomotic circulation at whatever point the amputation is made. One now splits the deep fascia behind the lower stump of the ligated vessel, and peels out the rectum, fat, and glands from the sacral cavity down to the tip of the coccyx posteriorly and to the upper surface of the levator ani on the sides. This cavity is packed with moist pads to control whatever oozing may be present.

The peritoneal incision is now carried across the gut one-inch above the tumor and through the culde-sac between the gut and the bladder or the uterus as the case may be. The gut is then separated from the anterior organs by blunt dissection as far down as possible without too great traumatism; usually one can carry this dissection down to the prostate at least. This dissection having been made, the packing in the sacral cavity may be removed. By this time the sigmoid will have shown the effect of ligation, and one should select the lowest portion in which the blood supply is perfectly good, and carry it down into the hollow of the sacrum to the tip of the coccyx to measure whether it can be brought out to the anus without tension. If it cannot, one should learn whether it is the bloodvessels or the peritoneal covering of the meso-sigmoid which holds it. If the latter, incise it higher up in the same way as described above. If it is the bloodvessels one should feel which one it is and cut it between two ligatures as far from the gut as possible. Having loosened the gut sufficiently, one should wait a few minutes to see the effect of such ligation; but should never proceed until he is satisfied that he has loosened sufficient gut with perfect blood supply to restore the normal fecal outlet without tension. From here on the technic varies according to conditions, as follows:—

1st. If the tumor is of moderate size and is three inches or more from the anus, a narrow tape with long ends is tied around the gut just above the tumor; an assistant then stretches the sphincter and carries a long dressing forceps up into the rectum until the operator can feel it just below the tumor. With the parts well packed off, the bowel is perforated by the forceps, the long tapes are caught and dragged down through the anus; by traction on the tapes and pressure from above, the tumor is invaginated through the anus until the sigmoid is dragged down to the extent desired. With the pelvis thus cleared of the tumor and excessive gut, the operator is enabled to dissect

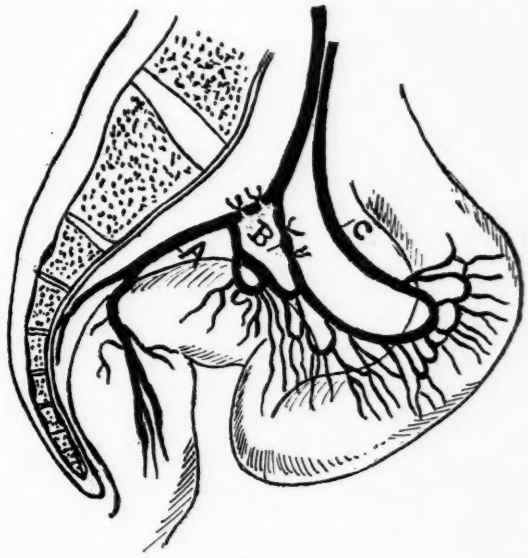

FIG. 1.

the mass loose further down toward the anus if necessary. This having been accomplished, the peritoneal folds which were peeled off in the beginning are now sutured back to the margin of the gut on either side, and together in front, until the floor of the pelvis and the meso-sigmoid are restored entirely. This is done, the abdominal wound is closed and dressed. If the patient is not in good condition the succeeding steps of the operation may be postponed until he recuperates; however, I have never found this necessary, as there is practically no loss of blood and very little shock to the preceding manipulations.

The patient is now put in the lithotomy position and the protruding gut treated as follows: The rectum or surrounding tube is cut through all around and caught with T-forceps, thus everting it; the intussuscepting sigmoid is thus brought into view and its circulation observed; the lowest point in this part of the intestine, in which the circulation is proven by needle puncture, is sewed by sutures

* See colored illustration.

to the muscular or intestinal wall of the everted rectum. The gut is then cut off just below these sutures, and its mucous membrane sewed to that of the anus, which is held by the T-forceps; a large rubber tube is now passed through the line of sutures into the sigmoid, and the mass is prevented from retracting by four sutures passed through the margin of the gut and the skin outside the anus. These sutures are left in three or four days until union between the parts shall have occured, and then retraction is allowed. An incision is made alongside the coccyx into the hollow of the sacrum and a rubber or cigarette drain inserted.

2nd Method. If the tumor is high up or too large to be invaginated through the anus after it has been loosened up, the assistant makes an incision along the side of the coccyx into the hollow of the sacrum, through which the tapes are caught and the sigmoid is dragged out through this aperture; the peritoneal floor and abdominal wound are closed as before, the patient is turned on the left side, the sacral incision is enlarged, and the tumor drawn out and excised, and the ends of the gut united by circular sutures—or they may be invaginated through the anus and treated after the method of Hochenegg.

3rd Method. If the tumor is low down, less than two inches from the anus, I prefer to dissect the growth out as in the perineal operation first, and if there is too great tension on the superior hemorrhoidal artery to bring the gut down with good circulation—pack off the parts and then go in through the abdomen loosening up the sigmoid and tieing off the blood-vessels as described above. Have an assistant then pull down the gut to the required extent, close off the pelvic floor and abdomen as before, and then suture the gut at the anus, as in the Tuttle-Quenn operation so often described. This method gives one the opportunity of completing the operation by the perineal method, which I well believe is advisable in low tumors, if there is no obstacle to their perfect accomplishment. It is the reverse of the procedure ordinarily advised, and which is practiced by Hartmann; but I find it diifficult to close the peritoneal floor and restore the meso-sigmoid before the gut has been dragged down to the required extent. For this reason, and for that just mentioned, that the abdominal incision may be avoided, I prefer the above technic.

The objections advanced against the combined operation are: 1st: Its hitherto high mortality. This is decreasing as the technic improves and dexterity in its performance increases; in the last three years Dr. Lynch and myself have done twelve cases, with one death, and not a single case of incontinence of feces. The one death was not in a cancer case. It occurred from shock in a syphilitic.

2nd: The objectionable artificial anus so long advised in this method and by so many surgeons as making the operation more radical and safer. It does neither, and is very rarely advisable; we have not resorted to it but once in our twelve cases.

3rd: The great amount of gut sacrificed in bringing the gut down to the anal aperture. There is no more gut lost in this method than is put out of commission by an artificial anus, moreover, the amount of sigmoid removed does not seem to add much to the gravity of the operation so long as the proximal circulation is intact.

4th: The danger of peritoneal infection. This ought not to be more than in other abdominal operations, for the gut is not opened until the peritoneal cavity is closed off, and when it is opened it is outside of the body and of the field of operation.

OBSERVATIONS ON THE TREATMENT OF PLACENTA PREVIA, BASED ON THE STUDY OF FORTY-TWO CASES.*

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In the revival of interest in obstetrical problems the treatment of placenta previa has attracted its share of attention, and it may be of interest if I present for consideration, first, a brief review of the plans of treatment in general use; second, an analysis of forty-two cases, with a report of fifteen cases delivered by the writer; third, a narration of cases illustrating some of the conditions commonly encountered, and methods which seem to the writer best adapted to dealing with them.

The principal plans of treatment in use may be described as obstetrical and surgical.

OBSTETRICAL METHODS.

The Expectant Method. The early method of treating placenta previa was palliative and expectant,—rest, sedatives and tamponade of the vagina, in the futile hope of arresting the bleeding, and, when driven to the wall by prolonged or furious hemorrhage, delivery by force as a last resort. This is an exceedingly bad plan of treatment because neither rest, sedatives nor tamponade will

* Read before the Brooklyn Medical Society, November 19th, 1909.

control the hemorrhage except in the mildest of cases, and especially because the emptying of the uterus is frequently delayed until the patient is so weakened by the loss of blood that the shock of delivery is sufficient to turn the scale against her. It is not surprising, therefore, that this plan gave a mortality of twenty-five per cent.

Manual or Instrumental Dilatation of the Cervix and Rapid Extraction. This is an improvement on the palliative treatment because by this method many of the bad cases will be saved. But deep tears of the cervix or even rupture of the lower uterine wall are not infrequent sequelae of this procedure, for the lower uterine segment is abnormally thin and friable in these cases; and the violent hemorrhage which may accompany the dilatation will often lead the operator to attempt to drag the fetus through the undilated cervix.

Bimanual Version and Spontaneous Delivery. Hoffmeier, in 1882, advocated delivery as soon as the diagnosis was made by slight dilatation of the cervix and bimanual version by the Braxton Hicks method, allowing the patient to deliver herself. The advantages urged for this method are that version can be performed with very little dilatation of the cervix, only two fingers being needed, and consequently with very little hemorrhage and shock; that the breech effectively tampons the cervix and as much time as is needed may be taken for the delivery of the child. As the success of the method depends upon the fact that the cervix can be dilated slowly and naturally, care must be taken not to jeopardize the result by making strong traction on the leg in the hope of hastening the delivery.

This treatment reduced the maternal mortality from its former high rate to the inconsiderable one of 4% or 5%. In 1905, Holmes * collected 1,029 cases treated by this method with a death rate of 3.3 per cent.

While combined version gives such brilliant results in saving the lives of the mothers, it does so at the expense of a very considerable increase in the fetal mortality. This is very well shown by the statistics of Küstner and Strassmann, quoted by Williams.** The former, who used bag dilatation, had a fetal mortality of 35%, while the latter, who employs combined version, had a fetal death rate nearly twice as high, 61.22 per cent.

If there is any reason for searching for a new method of treatment, it must be with a purpose of reducing the fetal mortality. Whether this is susceptible of any material reduction is a debatable question. Premature birth is the rule. Add to this the danger of asphyxia from placental separation, and the traumatism of artificial delivery, and we have a combination of circumstances that are exceedingly unfavorable to the life of the child. In this series none of the babies born under eight months survived, although five were living at birth. But in a certain percentage of cases that go into the eighth or ninth month, a well developed baby may be expected. In these cases the child deserves consideration. The plan of treatment that will give the best results for the babies is one that shortens labor and makes the delivery of the child easy. On the other hand, it has been shown by the results of the Braxton Hicks version, that the interests of the mother demand a slow dilatation of the cervix and a slow delivery. Hence an apparent clashing of interests. To reconcile the opposing interests of mother and child, a plan of treatment is needed by which hemorrhage is controlled, the cervix dilated in a reasonably short time, without risk of injury to the birth canal, and the way prepared for easy delivery. The following method seems to the writer to meet these conditions better than any other.

Bag Dilatation and Delivery by Version. Hydrostatic bags have been used in placenta previa since the time of Barnes. The evolution of the bag has been slow, and it has only recently become practical and efficient in the form familiar to most of us, the Pomeroy bag. The great advantage which this bag possesses over its predecessors is that it is not dependent on uterine pains, but is an active dilator whose power can be controlled by the operator.

It can be introduced without shock, often without an anesthetic, through a cervix that admits one or two fingers at most. Once introduced, and both compartments filled, one has a contrivance that clamps the lower uterine wall and arrests the bleeding by pressure applied in the only effective way, that is, from above, and places the operator in complete command of the situation. Should the patient be suffering from acute anemia the bag may be left in place and attention directed to the treatment of her general condition. If the child is viable its chances are greatly increased because the cervix, vagina and perineum may be well dilated and the traumatism of delivery reduced to the minimum.

The chief danger of bag dilatation is the possibility of deep tears of the cervix or even rupture of the uterine wall, if the dilatation is too rapid or too extensive. This danger is comparatively slight, and in the hands of one accustomed to the use of bags the risk ought to be less than by any other method, because the hemorrhage is under control and there is no occasion to hurry or use force.

* *Journal A. M. A.* May 20, 1905.
** Text-Book of Obstetrics. J. W. Williams.

Bar* has used an inflatable bag in 171 cases, where artificial dilatation of the cervix was needed, without any severe lacerations or a fatal hemorrhage. In these cases slight lacerations of the cervix were the rule. While in 30 cases dilated with the fingers lacerations of the cervix occurred in 30 per cent., and two of the cases died of severe hemorrhage following delivery.

SURGICAL METHODS.

Cesarian Section. Under the leadership of Tait, some twenty years ago, an attempt was made to treat placenta previa by abdominal section. Up to 1905, 30 cases had been operated upon with a mortality of 20 per cent. As German and English obstetricians were delivering cases of placenta previa by combined version during the same period with a death rate of four or five per cent., it is not surprising that the operation met with little favor.

Recently there has been a revival of interest in the Cesarian operation, and it is being spoken of again as a method of delivery for the graver forms of placenta previa. Jewett,** in a paper read before the American Gynecological Society this year, collected 95 cases with a mortality of 11.5 per cent. Fry*** has found reports of 13 cases, operated on since 1905, with one death, a mortality of 7.7 per cent. If these cases were all complete previas, this is a very good showing for the operation, because it is generally conceded that the obstetrical treatment of this variety gives a much higher mortality.

But when we consider the indications which its advocates have laid down for the operation we will see that it can never become a practical method of treatment. The indications generally accepted are a complete previa in a primiparous patient, with a child of viable age, a cervix not dilatable, a birth canal not contaminated by previous attempts at treatment, and a patient in condition to stand a major operation.

These are not easy conditions to meet. Placenta previa is rare in primiparae; the complete form is rarest of all, and usually bleeds, and therefore demands treatment before the age of viability. A rigid cervix near term is extremely uncommon. Not one case of placenta previa in ten is met in hospital practice which has not been subjected to treatment before admission. Add to all this the practical obstacle of making a diagnosis of complete placental previa before the stage of full dilatation of the cervix, and one begins to appreciate the difficulties in finding the indications for the operation.

Therefore, it seems to the writer that the case where a Cesarian section is indicated will be seen so rarely that the discussion of it as a plan of treatment is of theoretical rather than of practical interest.

Vaginal Cesarian Section. In Germany, Dührssen and his followers are advocating incision of the cervix and anterior wall of the uterus, followed by version. While this procedure is of undoubted value in eclampsia and severe cases of accidental hemorrhage, its application in placenta previa does not seem logical. The bleeding during the operation must be severe; the risk of sepsis is undoubtedly increased. It seems to the writer that it must compete with bag dilatation, over which it offers no advantage except in that extremely rare complication of placenta previa, a rigid, undilated cervix, in the presence of which the writer would unhesitatingly chose abdominal in preference to vaginal section, as it gives the baby a better chance for life, with no added risk to the mother.

Ligation of the Uterine Arteries. Miller, of Pittsburg,* recommends tying the uterine arteries by passing a ligature about the vessels close to the cervix. He claims that this can be done easily, often without an anesthetic; that it controls the bleeding and allows time for a slow delivery. He has used this plan of treatment in 14 cases, with two deaths. It ought to be an effective way to deal with an uncontrollable hemorrhage; but in all probability neither those accustomed to the use of the Pomeroy bag, nor those who have learned to depend on bimanual version will find any indication for the operation.

ANALYSIS OF 42 CASES OF PLACENTA PREVIA.

The series comprises 27 cases treated by Dr. F. H. Stuart, or by the house obstetrician of the Brooklyn Hospital, under his direction; and fifteen cases delivered by the writer. The average age for the series is 28½ years. Ten were primiparae, 32 were multiparae. The average duration of pregnancy was less than seven months.

Complete placenta previa occurred 7 times, incomplete 35 times. Of the latter variety 16 cases were partial, 19 were marginal. All the cases except one came under our care after treatment at home for periods varying from a few hours to several weeks.

Over one-half the cases were having labor pains when admitted. The presentation was vertex in

* L'accouchment par dilatation rapide du col. P. Bar. Ann. de gynec. et d'obst., Paris, New Series ii, No. 9, pp. 629-692.

** Cesarian Section in Placenta Previa. Charles Jewett, Am. Jour. of Obstetrics, June, 1909.

*** Indications for Abdominal Section in Placenta Previa. Henry D. Fry. Am. Jour. Obstetrics, June, 1909.

* American Journal of Surgery, January, 1909.

34, breech in 7, and transverse in one case. Prolapse of the cord complicated 3 cases, prolapse of an extremity 1 case. Artificial dilatation of the cervix was required in 15 cases. It was accomplished in one with metal dilators, the fatal case, in 4 with hydrostatic bags, in 10 manually.

Labor terminated spontaneously in 21 cases. Delivery was aided by podalic version and slow extraction in 10 cases, by combined version in 4 cases, by forceps in 3, and by bringing down a foot in 4 breech cases. Of 19 marginal cases all but 3 were delivered without other treatment than tamponade or rupture of the membranes; of the 23 cases of partial and complete previa 5 only were delivered without operative interference.

All the cases with incomplete previa recovered. One of the cases with complete previa died, making a mortality for the series of 2.3 per cent.

In computing the fetal death rate I have divided the cases into two classes, those going to eight months or more of utero-gestation, and those delivered before the eighth month. Of the former class there were twenty, giving birth to 14 living babies, 2 of which died later, making a death rate for this class of 40 per cent. Of the latter there were 22, giving birth to 5 living babies, all of which died later, making a death rate for this class of 100 per cent. Note should be made of the high death rate among the very premature infants, as it is the best of arguments against palliative treatment be-

TABULATED REPORT OF 15 CASES, TREATED BY THE AUTHOR.

Case No.	*Age.*	*Para.*	*Gestation.*	*Variety.*	*Hemorrhage.*	*Pains.*	*Cervix.*	*Presentation.*	*Previous Treatment.*	*Delivery.*	*Mother.*	*Child.*
B. H. 522	34	viii	8 mos.	Marginal.	Moderate.	Strong.	Thin, dilating.	R.O.A.	Tamponade. Rupture of Membrane.	Spontaneous.	Recovered.	Still born. Asphyxia.
B. H. 1066	29	vi	8½ mos.	Marginal.	Moderate.	Frequent, strong.	Soft, thin, moderate dilatation.	L.O.A.	Rupture of Membrane. Tamponade.	Spontaneous.	Recovered.	Lived.
B. H. 1296	28	i	7½ mos.	Marginal.	Slight.	Good after tamponade.	Soft, thin, slight dilatation.	L.O.A.	Tamponade. Rupture of Membrane later.	Spontaneous.	Recovered.	Still born. Premature.
B. H. 1187a	Not stated.	xii.	6 mos.	Partial.	Moderate.	Regular, strong.	Soft, thin, 3 fingers.	L.O.A.	Tampon.	Spontaneous.	Recovered.	Still born. Premature.
B. H. 1456	27	iv	7 mos.	Partial.	Moderate.	Slight and ineffective.	Thin, 2 fingers.	L.O.P.	Tampon. Bleeding not controlled.	Bag dilatation, forceps.	Recovered.	Born alive. Died, prematurely.
B. H. 1730a	25	ii	7 mos.	Central.	Severe.	No labor pains.	Thin, soft, 3 fingers.	L.O.A.	Tamponade. Hypodermoclysis.	Manual dilatation. Podalic version	Recovery.	Still born. Prematurely.
B. H. 1720	29	i	Full term.	Marginal.	Slight.	Absent.	Soft, no dilatation.	L.O.A.	Tamponade, ineffective.	Bag dilatation. forceps.	Recovered.	Lived.
B. H. 1702	36	vii	7 mos.	Central.	Severe.	Slight, ineffective.	Thin, 4 fingers.	R.O.A.	Tamponade, infusion.	Combined version.	Recovered.	Still born. Prematurely.
B. H. 1868	25	i	6 mos.	Partial.	Severe.	Frequent, ineffective.	Thin, ¾ dilatation.	R.O.P.	Pamponade.	Version.	Recovery.	Still born. Prematurely.
B. H. 2286	20	ii	7 mos.	Partial.	Severe.	Pains irregular, weak.	Thin, soft, 4 fingers.	L.O.A.	Tamponade.	Manual dilatation, version.	Recovery.	Still born. Premature.
B. H. 2328	23	iii	8 mos.	Partial.	Severe.	Regular, strong.	Thin, ½ dilatation.	L.O.A.	Tamponade.	Manual dilatation, Podalic version	Recovery.	Still born. Asphyxia.
B. H. 2345	26	i	8½ mos.	Central.	Moderate.	No true pains.	Soft, ½ inch thick, 1 finger dil.	L.O.A.	None.	Bag dilatation, version.	Recovery.	Lived.
B. H. 2839	38	x	8 mos.	Partial.	Severe.	Strong pains.	¾ dilatation.	L.O.A.	Tampon. No result.	Manual dilatation, version.	Recovery.	Born alive. Died 5th day.
Private case.	20	i	6 mos.	Partial.	Slight.	Strong, regular.	Good dilatation.	Breech.	Rupture of Membranes.	Spontaneous.	Recovery.	Still born. Prematurely.
Private case.	31	ii	8 mos.	Marginal.	Moderate.	Frequent, good.	2/3 dilation.	Vertex.	Rupture of Membranes.	Spontaneous.	Recovery.	Lived.

fore the age of viability. In connection with the present tendency on the part of some surgeons to treat the grave forms of placenta previa by Cesarian section, in the interest of the child, it is worthy of note that 17 of the 23 cases of complete or partial previa had to be delivered before the end of the seventh month.

CASE I.—Marginal placenta previa. Labor pains strong, cervix dilating, hemorrhage moderate.

Mrs. J. W., aged 30, second pregnancy. Period of gestation 8 months. Seen at her home, October, 1907. History of pregnancy normal up to time of attack. While hanging out clothes was taken with pain in abdomen and gush of blood from vagina. When seen two hours later by the author, she had lost a moderate amount of blood. Her general condition was good. She was having pains every five minutes. Vagina full of blood clots. Fresh bleeding. Cervix two-thirds dilated. Edge of placenta felt on right side. Head presenting; child small.

Indication, to control the bleeding. Treatment, rupture of the membranes. Result, head engaged; hemorrhage ceased, pains increased. Spontaneous delivery two hours later. Child 4 1/3 pounds; lived. Mother recovered.

CASE II.—Primipara and over time. Case No. 1,720. Age 29. Admitted to Brooklyn Hospital April 19th. Induction, marginal placenta previa. Pregnancy normal. One week over time. Abdominal examination: uterus symmetrical, fundus near ensiform, position L. O. A. Head at brim.

Vaginal examination: Perineum dilatable, vagina roomy. Cervix soft, so admits tips of finger; no bleeding. No disproportion.

Indication, patient apparently over time, and induction of labor decided upon. April 19th attempt was made to induce labor by Krause method. Introduction of catheter caused brisk hemorrhage. Catheter withdrawn. Cervix and vagina packed; patient returned to bed. Pains started six hours later, continued throughout the night, then ceased. Following day, tampon removed; cervix admitted two fingers. Voorhees bag introduced without stimulating pains; left in 12 hours, removed and Pomeroy bag No. 1 introduced, cervix dilated, after twenty minutes bag withdrawn. Brisk hemorrhage followed. Examination showed marginal placenta previa, posteriorly and to the right. Bag No. 2 introduced, dilation continued; after withdrawal of this bag membranes ruptured, head forced into brim by suprapubic pressure and forceps applied. Slow delivery, occupying fifty minutes. Baby weighed 8 pounds, 14 ounces, badly cyanosed, resuscitated with difficulty. Mother sustained second degree laceration of perineum. Condition after delivery good. Loss of blood during delivery insignificant. Convalescence rapid and uneventful. Baby lived. Examination on discharge showed a slight lateral laceration of cervix, perineum healed.

CASE III.—Partial placenta previa. Multipara in labor. Full dilatation. Abnormal presentation. Severe hemorrhage.

M. W., age 38, 10th pregnancy. Referred by Dr. Paffard. Admitted to the Brooklyn Hospital September 16th, 1909. Period of gestation, 8½ months. History of pregnancy normal. Labor pains started at 1 P. M. of day of admission, accompanied by hemorrhage from vagina. On admission patient suffering moderately from anemia. Pains strong and frequent, hemorrhage profuse. Vagina tamponed by house obstetrician. When seen by the writer at 7 P. M. patient was bleeding through tampon, and exhausted from loss of blood.

Examination: Cervix fully dilated and one-third covered by placenta. Membranes ruptured. Arm prolapsed. Indication for treatment to control hemorrhage and correct malpresentation. Treatment: Light ether anesthesia. Podalic version. Cervix plugged with breech, hemorrhage stopped. Anesthesia withdrawn. Delivery easily accomplished. Baby badly asphyxiated, resuscitated with difficulty; died on fifth day, asthenia. Mother made normal recovery.

CASE IV.—Complete placenta previa. Cervix partly dilated. Severe hemorrhages on day of admission. Fainted twice from loss of blood. Treatment before admission, rest, tamponade of vagina, sedatives. Bleeding through tampon. Condition on admission; signs of acute anemia present. Lips blanched, pulse small and rapid, respiration labored, air hunger. Vision impaired.

Examination, cervix soft, thin, four fingers dilated, completely covered by placenta.

Abdominal examination, fundus near ensiform. Presentation, cephalic. Fetal heart not heard.

Indications to control hemorrhage and to treat anemia to dilate cervix, and to overcome obstruction to delivery presented by placenta.

Treatment: Light ether anesthesia. Fingers passed through placenta, bimanual version, breech pulled into cervix. Bleeding stopped. Anesthesia discontinued. Saline infusion under breasts. Patient rallied promptly. Baby delivered about twenty minutes later, dead of asphyxia. Mother made slow but uncomplicated recovery.

CASE V.—Complete placenta previa. Primipara, full term, cervix not dilated.

M. P., age 26, first pregnancy. Referred by Dr. Dee. History: Pregnancy normal up to three days before admission, when she began to bleed from vagina. Bleeding continued with slight intermissions. When admitted to the hospital her general condition was not alarming. She was restless and nervous and depressed from loss of blood, but she showed none of the severe signs of acute anemia.

Abdominal examination: Uterus symmetrically enlarged. Fundus near ensiform. Head in left iliac fossa. Fetal heart strong. Vaginal examination: Vagina full of clots, cervix one-half inch long, admits one finger easily. Placenta felt in all directions. Fresh bleeding.

Diagnosis: Central or partial placenta previa, in primiparous woman with undilated cervix. Child viable.

Indications, to control hemorrhage, to empty uterus without jeopardizing the interests of mother

or child. The case seemed to present the indications for Cesarian section. The matter was placed before the husband in the following light: that Cesarian section offered the very best chance for the baby, and probably as good a chance for the mother as delivery by the vaginal route. The husband refused permission for the major operation, and bag dilatation was chosen as offering the next best chance for baby as well as the mother.

Under light ether anesthesia, Pomeroy bag No. 1 was introduced. After twenty minutes it was expelled and bag No. 2 was inserted. It required about thirty minutes to dilate the cervix to the size of this bag. After it was expelled the largest bag was introduced but filled to less than its full capacity, and allowed to remain about fifteen minutes, when it was emptied and withdrawn. During the dilatation the bleeding was insignificant, and the patient's condition remained good.

Examination now showed good dilatation of the cervix and vagina. The hand was passed through the placenta and version performed. A living baby weighing 7½ pounds was delivered without difficulty. The mother sustained a laceration of the left side of the cervix reaching to, but not into the fornix, and a second degree laceration of the perineum. Both were repaired at once.

The condition of the patient after delivery was very good. Her pulse was 100, temperature 100.8. The day following her temperature was 99, her pulse 90.

The convalescence was normal except for an occasional rise of temperature during the first week. The baby lived and was discharged in good condition.

The conclusions which the writer has reached from his study of the literature and the above series of cases are:

1. That the diagnosis of a placenta previa should always be followed promptly by the termination of pregnancy.

2. That the main indications in the treatment are to control hemorrhage, to shorten the first stage of labor, to protect the mother from traumatism and sepsis.

3. That next to hemorrhage, lacerations of the lower uterine segment present the gravest danger, and are always caused by rapid dilatation of the cervix or attempting to deliver through a birth canal only partly dilated.

4. That if too much consideration for the life of the child be felt, too little consideration for the life of the mother may be shown, and this is justified neither by theory nor by results.

5. That in cases near term, when the child is alive, the interests of both mother and child can best be protected by the use of the Pomeroy bag.

6. That marginal cases may call for little treatment beyond tamponade or rupture of the membranes, while partial and complete cases will always demand active interference.

7. With an undilated cervix the Pomeroy bag affords the best means of controlling the hemorrhage and dilating the cervix.

8. That those unaccustomed to its use will get the best results from combined version.

9. That skill in the obstetric methods of treatment will rarely be required.

295 HANCOCK STREET.

TUBERCULOSIS OF THE FALLOPIAN TUBES AS AN ETIOLOGICAL FACTOR IN ECTOPIC PREGNANCY.

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There has been little spoken and less written upon this topic, yet it presents one of the important conditions the abdominal surgeon has to meet. It was with a hope of bringing this subject before the profession that I wrote a monograph some ten years ago. The purpose of this paper is to present additional data, derived from my surgical experience along this line, which furnishes me firmer grounds for my belief that tuberculosis is an etiological factor in ectopic pregnancy.

As far back as 1669 attention was called to the condition of ectopic pregnancy by Riolanus, Benedict, Vassal and Regnier de Graaf, and in 1500 abdominal sections were performed for this condition by Nufer and Dirlwang. In 1752 Bohmer differentiated three forms of ectopic pregnancy—tubal, ovarian and abdominal—and in 1801 Schmidt described interstitial pregnancy; but none of them has associated tuberculosis of the tube as a cause of ectopic pregnancy.

It is difficult to determine the proportion of extrauterine to intrauterine gestations, but about one to seven hundred would be a fair approximation.

Winckel, however, saw but sixteen cases in 22,000 births, and Bandl, of Vienna, saw but three out of 60,000 births.

In America, especially in the large cities, there seems to be a much larger proportion than this. In my practice this, perhaps, can be attributed to the fact that many cases have been seen by me in

consultation, whereas cases of intrauterine pregnancy rarely require the services of an abdominal surgeon.

A short examination of the common pathological conditions met with in tubal disease will afford excellent à priori reasons in support of my contention.

In cases of infection the mucosa of the tubes exhibits round cell infiltration, hyperemia of the mucosa, agglutination of the opposed surfaces at the terminal expansion of the plications, and the inclosure of cyst spaces beneath. The ciliated epithelium may be found preserved in these deeper spaces, but may early disappear, being replaced by granulation tissue on the periphery of the plications. There may be such an intimate union of the latter by adhesions that there is not a continuous tubal canal. This is most commonly the case in gonorrheal infection.

The staphylococci and colon bacilli and many other bacilli, if they are in the condition of diminished virulence, can produce tubal catarrh. An early result of these infections is to close the abdominal ostium of the tube. Another method of closure is by an exudate of lymph around and over the fimbriae, sealing the infundibulum.

As pus accumulates within the tube the lumen is enlarged and the mucosa is enormously hypertrophied. The degree of distension depends to a great extent upon the degree of inflammation in the tubal walls. If there is a pronounced interstitial salpingitis with great thickening of the muscularis, the distention of the tubal canal is limited. If the walls offer feeble opposition, the lumen of the canal may reach the size of a fetal head.

Gonococci confine themselves mainly to the mucosa, but they may invade the muscularis and serosa. Streptococci generally penetrate the tubal walls arriving in the tubal canal in this manner. The peritoneal surface is therefore commonly involved in streptococcic infection, patches of purulent material clinging to the serosa, as they do in the intestines in general peritonitis.

It will be noted that in these lesions due to the pus-forming bacilli, there is not only obstruction to the passage of the ovum through the tube, but also a local toxic area fatal to its growth in the surrounding tissues. The morbid anatomy of tubal tuberculosis presents a different picture.

The tubercle bacilli may invade any of the tissues, mucosa or serosa, and often extend through the entire structure. The tuberculous tube, when in an advanced state of infection, is thickened, distended, tortuous, hard and nodular to the touch, and is often thickened through its whole length, having the shape of a pus tube in its outer two-thirds. In this condition more than in other forms of tubal disease, the wall is found to be hypertrophied and infected in the muscular layer.

The peritoneal surface is thickly studded with miliary and often caseating tubercles which are plainly visbile, and the abdominal ostium may be closed by an exudate which prevents the passage of the ovum to the tube. Cheesy deposits containing tubercle bacilli are found in the mesentery, bowel, broad ligament, ovary and omentum.

The acute form differs from that of the chronic in the rapid destruction of both mucosa and muscularis; there is also round cell infiltration of the mucosa, and numerous tubercles with comparatively few giant cells, and many bacilli; while in the chronic form there is a gradual development of tuberculous inflammation, few bacilli, and the tubercles contain many giant cells; there may be vegetations resembling those of malignant neoplasm.

Tubal tuberculosis is usually bilateral, and is either primary or secondary; in the first case the bacilli find their way to the tube by means of the blood or lymph, and no deposits elsewhere are discernible, but it is believed that abrasions or ulcerations of the vaginal introitus are the original point of entrance. Secondary tubal tuberculosis is a much commoner form and is due either to a blood or lymph infection from distant foci, or the direct extension of the disease from contiguous organs, such as the bowel or peritoneum.

From the description here given it will be seen that tuberculous salpingitis is characterized by overgrowth rather than necrotic ulceration. The products of its activity are less immediately toxic than those of the pus bacilli. On the other hand the hyperplasia and fibrosis is more directly obstructive to the lumen of the tube than the purulent exudates of the other bacilli. We thus have a condition that is well capable of obstructing the outward passage of the ovum without destroying its vitality. As to the frequency of tuberculous disease of the tube statistics vary. In 4,000 cases of tubal disease seen at autopsy Hirst found 53 tuberculous, Williams 29 in 814, and Menge 7 in 70. Byford states that statistics vary from 2 to 8%. Most unfortunately my own records were destroyed in the fire of 1906, but speaking from memory I am convinced that the proportion of tuberculous cases was higher than those quoted.

Ectopic gestation may be due to any disease of

the mucous membrane of the tube depriving its cells of their cila, forming polyps or obstructing its caliber and predisposing to an arrest of the impregnated ovum in its passage to the uterus, or any condition interfering with the normal peristalsis of the tube. In tuberculosis we have all these conditions. My attention was first called to the importance of tubal tuberculosis as an etiological factor by the circumstance of encountering three cases of ectopic pregnancy within a month, each case being associated with advance pulmonary tuberculosis. I am able to recall three other cases of twin pregnancy, one fetus in the tube and one in the uterus, in all of which the tubes were tuberculous. In another peculiar case referred to me by Drs. J. H. Seymour and J. A. Andrews, in which there was a seven months' extra-uterine pregnancy, the placenta extended from the upper inner third of the uterus through the ruptured right tube into the abdominal cavity and was attached to the peritoneum, omentum, bowel and liver; the uterus was enlarged to that of a four months' pregnancy. This patient was tuberculous. Altogether I can recall that out of 64 cases of ectopic pregnancy 42 were tuberculous, the pathological condition having been confirmed in the laboratory. These clinical experiences, strengthened as they are by the inherent probability of tuberculous infiltrations being obstructive rather than destructive to normal fetal growth, force upon me the conviction that in tuberculous salpingitis we have the most common cause of ectopic gestation. I offer these suggestions in the hope and expectation that they will receive confirmation from the experience of fellow-workers.

701 PHELAN BUILDING.

RABBIT SERUM INJECTIONS AGAINST HEMORRHAGE IN CHOLEMIA.

Patients with jaundice are given salt solution and fresh rabbit serum before operation. Of the latter 15 to 30 ccm. are given subcutaneously 24 hours before operation, and repeated after operation if there is any indication of hemorrhage. . . . . We have used the serum in all jaundiced cases, whether actively bleeding or not, and now, at the end of a year, we have not seen any case of operative or post-operative hemorrhage, though we have operated on a considerable number of patients that, *a priori,* should have given us much anxiety. We would urge others to try this method, because our experience is far too small to advocate it as an infallible remedy—JOHN C. MUNRO in *The St. Paul Medical Journal.*

SOME OBSERVATIONS ON THE REMOVAL OF TONSILS.*

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An eminent surgeon has said that the tonsil is of greater clinical importance than the appendix, and causes more suffering and deaths. If his conclusions be true, the subject of my paper is worthy of our most serious consideration, and I need offer no apology for discussing what might seem to be a hackneyed topic.

The more consideration I have given to the subject, the more I am impressed with the fact that the profession is not united in its opinion of the proper method to be pursued nor of the time and conditions which justify an operation. We are all agreed that there should always be present some well defined reasons for removing tonsils, but what reasons shall justify an operation, is a matter of difference of opinion. Emil Mayer divides them into two classes: 1st. He justifies a removal when there exists a simple hypertrophy which causes interference with respiration and, 2nd, there must be present a diseased condition of the tonsils themselves which cause local or constitutional infection.

All of us have seen children who seem to be the picture of health, who neither slept with their mouths open nor made complaint of difficulty in breathing, but who after an examination by some school inspector, were found to have enlarged tonsils and have been referred to our clinics that these might be removed. Was it necessary that these children, who give no evidence of disease, should be subjected to an operation merely because their tonsils were prominent?

I have seen these tonsils operated upon in our clinics and to my question why they have been removed came the reply that if such action had not been taken the children would have found trouble in re-admission to the schools.

This is the age of fads and fancies, and through weakness we are too apt to follow them. In my opinion that surgeon who enucleates every tonsil without regard to the existing conditions, simply because the demands of the hour seem to require it, is guilty of the practice of empiric surgery, just as is the surgeon who would remove every appendix because it might become inflamed.

* Read before the Section on Laryngology of the New York Academy of Medicine, December 22, 1909.

The gynecologist now believes that functionating organs should be preserved, at least so far as the safety and comfort of the patient will permit. And yet we are enucleating functionating organs without first making a careful study of the case and deciding what, if any, operation should be performed.

As bearing upon this aspect of the subject, may I cite, with my own personal approval of the opinion of the author, from page 376 of Ballenger's most excellent work. He there says: "It may still be questioned whether it is good practice to remove tonsils in the wholesale manner now in vogue. The function of the tonsil in a child and in an adult is still an open question. When does the function cease or become so altered by disease as to justify the removal of the tonsil? Should the tonsil be partly or completely removed? When removed, what organ performs its function? These and other questions are not fully answered."

We may admit that all of the functions of the tonsils are not definitely established, but we know that at various points on its surface and especially in the crypts there occurs what is known as lymphoid infiltration of the epithelium.

Regarding the function of the tonsils, Jonathan Wright says: "In common with the lymph glands, the bone marrow and the spleen, the tonsil shares to some extent in the manufacture of the multinuclear leucocytes. The tonsil and its crypts is an automatic vaccinating depot for bacterial cultures. Enough bacteria are let through the surface, in the changes of surface tension, to keep the internal antibodies up to the general level of immunity. In other words, the tonsil is one of defense against infection."

Bruger and Görke, who regard the pharyngeal tonsil as an organ which protects childhood, expresses the opinion that when hypertrophied, it furnishes a more efficient protection against the entrance of the germs of the diseases of childhood. From embryology we learn that the faucial tonsil springs from the region of the ventral part of the second inner branchial groove, and when the third month after birth has been reached, distinct lymph follicles with germinal centers are formed. In the lingual tonsil follicles do not appear until the age of five, while in the pharyngeal tonsil, which appears during the sixth month of fetal life, follicles may appear even before birth or their appearance may be postponed until a year or two later.

That tonsils are vestigial organs seems improbable when we recall the fact that tonsils are found in all forms of animals from reptiles up to man.

Again as to the true function of the tonsil, Robertson says it has to do with early life, and at birth the gland is so small as to be unimportant. Its full development is attained when the sixth or eighth year has been reached, and then it begins to atrophy. At twelve or fourteen years it has either completely disappeared or then shows as an hypertrophy or cicatrical mass between the pallatine pillars. Robertson further remarks that any tonsil which is visible to any marked degree after this time of life may be considered as a morbid growth due to disease. Clinically, nearly all children at the age of six have adenoids and enlarged faucial tonsils, while at eight there are probably eight-five per cent. of them, at ten thirty-five per cent. and at twelve about fifteen per cent.

Accepting as true Robertson's figures that 85 per cent. of all children at the age of eight have enlarged faucial and pharyngeal tonsils, and in the light of what has already been said, are we not justified in assuming that the tonsil has a definite function to perform in the human economy? It should therefore not be removed unless it be for definite and sufficient reasons.

It may be remarked that no one of experience removes the tonsil unless he has good reasons for so doing. But none of us is infallible and every one is liable at times to err. Personally, I do not claim for myself infallibility, and in confessing my weakness, I frankly admit that I have at times erred in this direction. I would most earnestly urge a very careful study of these cases before we attempt to operate.

As to infections through the tonsils, the literature of our profession is abundant. Goodale, Richards, Jacobi, Mayer, Stewart, Adler, Anderson, Brown, Packard, Wood, Wright, Hurd and many others whom I need not mention, have pointed out the undeniable fact that rheumatism, tuberculosis, cervical lymphadenitis and other diseases of an infectious character result from infections through the diseased tonsils.

As early as 1885 the writer read a paper before the Union County Medical Society calling attention to the close relationship between tonsillitis and rheumatism, since which time he has frequently demonstrated to himself and others the close dependence of one upon the other. It

is conceded that when a patient suffers from any infection which can be traced to a diseased tonsil the sooner that tonsil is removed the better it will be for the patient, and in these cases the tonsil should be removed in its capsule. The writer regards the lymphoid tissue which contains crypts as tonsillar tissue, and does not seek to remove every vestige of lymphoid tissue which does not contain crypts. Often lymphoid tissue has been observed in the supratonsillar fossa and below in the fossa at the base of the tongue, but unless it proves to be cryptic it is not cut out and no harm has as yet been observed from leaving this tissue in position.

The following case affords the most conclusive evidence of the benefits to be derived from the enucleation of the tonsils:

A woman, aged about thirty, consulted me six years ago for a sore throat. The follicles of the pharynx were found to be enlarged and red, with the crypts of a moderate-sized tonsil filled with cheesy dèbris. She complained not only of sore throat but of pains in her chest. A careful examination showed the chest pains to be muscular, and they were, in my opinion, due to infection from the tonsils. The removal of the tonsils was advised, but the patient would not consent to the operation. The crypts were cleaned out and painted with equal parts of tincture of iodine, carbolic acid and glycerine. She would consult me four or five times a year for the same trouble. The method adopted gave her invariably immediate relief. Five years ago an eminent physician told her she had false angina pectoris. Another equally eminent physician was consulted, who told her that the pains were entirely muscular and of a rheumatic character. Sodium salicylate or aspirin would give her relief for a short time. The next winter she spent in Italy, and while there was under the care of an English surgeon, who treated her all winter for rheumatism. In the spring she returned to this country still complaining of the pain in her chest and an occasional sore throat. In September, 1908, she submitted to the removal of her tonsils, and from that time until the present, one and a half years, she has neither suffered from sore throat nor have her chest pains returned, and now the patient is an ardent advocate of the removal of tonsils.

But, you may ask, what do I consider the indications for enucleation of the tonsils? They are recurrent attacks of quinsy, cryptic inflammations which will not yield to less radical measures, rheumatism, enlarged cervical glands or other infections due to the tonsils, middle ear inflammations which may be due to enlarged faucial or pharyngeal tonsils, reflex cough due to tonsils or adenoid tissue, and impaired nutrition when of tonsillar origin. There have been purposely omitted simple tonsillitis, simple hypertrophy, benign growths and granular pharynx as given by Geo. L. Richards in his admirable paper on "The Present Status of the Tonsil Operation," because in his experience these conditions have been treated successfully without enucleating. If, for any reason, these conditions should not yield to appropriate treatment in young children and the patient becomes a sufferer, there should then be no hesitation in recommending tonsillotomy. In all of the cases in which enucleation of the tonsils is recommended as before stated, tonsillectomy is advised —that is, the removal of the entire gland with its capsule. But in the other cases, the method of Bier of sucking out the crypts and painting them with equal parts of phenol, tincture of iodine and glycerine, or slitting the diseased crypts and applying chromic acid, or cutting off that portion of the tonsil which projects beyond the pallatine pillars, or punching out the central crypts, thus enlarging the mouths of the remaining crypts, giving exit to the dèbris which may there accumulate, is preferred and recommended. Moure, of Bordeaux, in his recent work, says the secretions which accumulate in the crypts have not a ready egress, and it is to this special formation that we attribute the occurrence of certain infections in this region.

According to my observations, this method of treatment followed fifteen or twenty years ago has been accompanied with no further trouble. But it must be admitted that in some cases where tonsillotomy had been performed by myself and others, the operation of tonsillectomy was afterwards necessary. This experience, however, does not militate against the simpler operation of tonsillotomy. The operator would have had the consciousness of knowing that he had done what in his opinion was the best for his patient, and he would have preserved as far as possible a functionating organ.

The only unfavorable symptom after the enucleation of tonsils that has come to my notice, has been dry throat, but the time at my disposal has been too short to make careful observations. If the enucleation of the tonsil can be avoided until ten or twelve years of age, the patient will have been given the benefit of whatever protection may be afforded by the tonsils. After the age of fourteen I can see no good reason why

the tonsil should not be enucleated instead of endeavoring to preserve a portion of the gland. A colleague told me of a patient who informed him that she would send her daughter to another surgeon to have the tonsils removed, because she thought him too radical in his views. The incident is mentioned for the purpose of impressing you with the fact that the laity are giving to the subject serious consideration and that it is from us that they must get their education concerning such matters. It behooves us, therefore, to first educate ourselves.

Having satisfied ourselves that in the case that comes to us the tonsils must be removed, what manner of operation should be chosen? I have had the pleasure and privilege of watching some of the members of this section in their work of removing tonsils, and with their permission a short description of their operation will be given with such comments thereon as have been suggested to me by my own experience and observation. The criticisms of the methods pursued, when offered, are not made in a spirit of captiousness, but in the hope that we may reach the best conclusions as to the proper method to be followed, in the discussion that may follow the reading of this paper.

It may be said in passing that in all the cases the operator, with the exception of the assistants in two hospitals, enucleated the tonsil. Each had his own methods and instruments and accomplished the entire removal of the glands. It is only fair to say, therefore, that the success of the operation is not to be attributed to the instruments employed, but rather to the complete freeing of the tonsils from their attachments. After dividing the plica so that the tonsil is held in position by its capsule and a small portion of plica below it will stand out free and clear and can then be separated from the constrictor muscle by almost any cutting instrument.

Let me say that in my opinion the operation with the patient in the upright position is a very different one from that required when the patient is on the back or side and the throat is filled with blood.

The first to be visited was Dr. Sidney Yankauer, who kindly took the trouble to show me the work he was doing. I witnessed his operation for the removal of tonsils and adenoid tissue as performed in the clinic of Dr. Emil Mayer at the Mount Sinai Hospital, New York. The instruments which he used were an O'Dwyer mouth gag, a Yankauer separator, a pair of curved scissors, a Yankauer tonsil forceps, a Yankauer modification of the Mosely snare and a Beckman curette. The patient was placed in the lap of an assistant while another assistant held the head. The mouth gag was introduced, the tonsil was grasped with the forceps, after it had been separated with the separator, and the pedicle of plica cut with scissors. The snare was then thrown over the forceps and tonsil, and the tonsil cut off by an assistant who turned the screw on the snare handle. Yankauer then introduced a large-sized Beckman curette and with one sweep of the handle brought the adenoid tissue out of the mouth. No anesthetic was used. The operation was performed in about five minutes and the tonsil was enucleated with its capsule attached. The child was then removed to another room and held over a trough while cold water was spurted into the mouth and throat from a small hose. The above operation is followed in the case of young children. Older children are given a general anesthetic and adults are operated under regional anesthesia as described in Yankauer's paper. For him I entertain only the highest opinion as an operator, but I cannot altogether agree with his statement that when the plica at the bottom of the fossa is cut the tonsil falls downward. I think the separator and scissors can be dispensed with if one uses a cutting instrument such as Hurd's sharp spoon or a Leland knife.

At this same clinic two operators were seen who evidently did not believe in the entire removal of the tonsil, and who stated that in their judgment their cases did quite as well as those of Yankauer. This in our opinion is as much of a mistake as it would be to enucleate in every case, because there are cases which must be enucleated. They demonstrated, however, that the tonsils can be removed in part or entire without any anesthetic.

The operation for the removal of tonsils and adenoid tissue by Dr. Lee M. Hurd at the Manhattan Eye and Ear Hospital, New York, was next witnessed. His method was as follows: The patient was etherized upon a table. After being well "under," he was placed in the upright position on a chair before a window, an assistant behind the patient holding the mouth gag and tongue depressor in position. Sitting in front of the patient, Hurd grasped the left tonsil first with his forceps and with his sharp dissector or

spoon cuts the mucous membrane at the head of the tonsil and the plica tonsillaris, dissecting the tonsil from its bed. The right tonsil was then attacked in the same manner. The tonsil was enucleated in its capsule. The patient's head is pushed forward when blood accumulated in the throat which is allowed to run out of the mouth into a basin which he holds between his knees. The average time for operations is six minutes. With a Gottstein curette or some modification of it the adenoid tissue is removed. Hurd informed me that he has never had a patient die from the effects of ether while in the upright position. It seems to me that the only objection that could be urged against his method of operating is the giving of ether in the upright position and the danger of injuring the constrictor muscle with his sharp spoon. A wire is less dangerous and just as effectual.

Dr. Frederick S. Lovell was the next one to extend to me the courtesy of watching him operate in the clinic of Dr. Beaman Douglass at the Post-Graduate Medical School and Hospital. The patient sat erect in a chair before the operator. Reflected light was used. The anterior pillar of each tonsil was brushed with a 10 per cent. solution of cocain hydrochlorate and the anterior pillars of each tonsil were injected with a solution composed of cocain hydchl, gr. 1, sol. adrenalin chl. 1 drachm, sterile water q. s. ad. 1 oz. The needle was introduced through the mucous membrane only, and not into the deeper structures. It was inserted six or seven times for each tonsil, but only a few drops were deposited at each insertion. Each tonsil requires about one drachm of this solution, but only one tonsil is injected at a time. No mouth gag or tongue depressor was used. The tonsil was first pulled out of its bed by means of a hook introduced into one of its crypts. Myles' submucous knife was then used to make a small slit at the upper part of the tonsil between the anterior pillar and the tonsil capsule. Then a pair of straight scissors with handle at 45° was introduced into this wound and the blades were then widely opened, thus dissecting the anterior pillar from the capsule. The tonsil was then seized with forceps and the dissection continued by snipping with the scissors close to the tonsil until the plica triangularis or pedicle was reached, when a nasal snare was passed over the forceps and the tonsil already dissected, and the pedicle cut through with the snare. The operation is the same under general anesthesia with the exception of the solution used which is adrenalin chlorid 1/10,000, and the patient is in the recumbent position. Lovell employed the local anesthetic, which to us seems the very best method in children above sixteen years of age, although this method is not absolutely painless. I believe the wire snare is safer and quicker for the dissection than scissors.

I next witnessed the operation for the removal of the tonsils and adenoid tissue as performed by Dr. Harmon Smith, at the Manhattan Eye and Ear Hospital, New York. The patient was etherized on an operating table. The instruments used were an O'Dwyer mouth gag, a short handled tongue depressor and a Leland right and left blunt pointed curved tonsil knife, together with Smith's modification of the Mackenzie tonsillitome. The throat was illuminated by an assistant holding an electric light. The knife was first inserted into the supratonsillar fossa and passed down between the tonsil and the anterior pillar. The assistant pushed the tonsil in from outside. Smith then put on his modified Mackenzie tonsillotome and with the finger pressing the instrument over the tonsil he enucleated it with capsule attached. For the removal of the adenoid tissue he uses the Chappell modification of the Gottstein curette. The time consumed was five minutes. Smith cuts the plica with Leland's knives, which are probe pointed, and he acknowledged that he thought they would be a little more useful if they were a little sharper on the point. He also has the assistant push the tonsil inward toward the cutting instrument. This may be only theoretically wrong, but it seems to us to be reversing the method and appears more dangerous, for occasionally the cut tonsil falls back into the throat.

At the clinic of Dr. H. Arrowsmith in the Brooklyn Eye, Ear and Throat Hospital, I was afforded an opportunity to observe two of his assistants operate, the doctor informing us that they did about the same operation as he was in the habit of performing. He made it plain that they only removed a portion of the tonsil unless for various reasons they wanted to perform tonsillectomy. The patient was etherized, but still had his reflexes. He was put upon the operating table with his head turned toward the window, no artificial light being used. The mouth gag was inserted and the tongue depressor used. The adenoid tissue was first removed with a curette.

No attempt was made to separate the tonsil from its pillar, except when the operation of tonsillectomy was made. The Mackenzie tonsillotome was used while an assistant pushed the tonsil inward. A portion of the tonsil remained between the pillars. The same method of operation was followed when tonsillectomy was performed except that the tonsil was separated from its bed by a sharp separator. It may be added that the tonsil came way in its capsule. At this clinic every facility was given to see the routine work. A tonsillectomy was performed with a Mackenzie instrument and an assistant pushing the tonsil inward. Most of the operations were tonsillotomies. Dr. Arrowsmith admitted that probably some of these cases did not need operation, but they were operated upon because the children had been sent there by the school inspector for the purpose of having the tonsils removed. This was the only clinic except at Dr. Mayer's, where they were doing both tonsillotomies and tonsillectomies. My criticisms are lack of illumination, pushing the tonsil in toward the median line, the removal of the adenoids before the pharyngeal tonsil, and danger of the tonsil falling into the throat. Arrowsmith said that in his opinion it is not always necessary to remove the entire tonsil.

Dr. John McCoy in the clinic of Dr. Coakley at the University-Bellevue College, gave me the opportunity to witness his removal of tonsils. In children he administers chloroform while on the back, for the reason that they come out of it quicker and can be sent home within an hour or two. In adults he uses cocain anesthesia, but I did not have the opportunity of witnessing the operation upon the adult. The instruments used are the Phillips headlight, an O'Dwyer mouth gag, a wooden tongue depressor, Leland's knives with the blunt point removed so that they are sharp, like a sickle, Yankauer or Richards tonsil forceps, Mackenzie tonsillotome and Moseley snare. McCoy has devised a combination dull and sharp spoon for adult cases. He separates the anterior pillar from the tonsil, cutting the plica from below upwards with a Leland knife, attacking the most dependent tonsil first. The upper tonsil is then separated in the same way. He then introduces the finger and examines the wound between the anterior pillar and tonsil, but does not break the plical adhesions, as in my custom, but reintroduces the knife if necessary. The tonsil being free, he grasps it with the forceps, slips a Mackenzie tonsillotome or Moseley snare over it and cuts the pedicle with the capsule attached to the tonsil. He then removes the adenoids with a Brandegee forceps and, if necessary, a curette after the Roaldes pattern. The average time is fifteen minutes. There is much to commend in his operation. He examines his patient after he has finished, using his finger freely, he uses tonsillar forceps and thus draws the tonsil away from the muscle and artery, and he is deliberate in his movements. The criticisms I would offer are that the plica might be stripped off with the finger after he has used his Leland knife, the use of chloroform, adenoid forceps, and the Phillips light, together with the sickle point on his knives. The use of peroxide of hydrogen in the nose after the removal of adenoids I have seen do harm by setting up middle ear disease.

Dr. Robert C. Myles was kind enough to afford me the pleasure of seeing him enucleate tonsils under a local anesthetic, in his office, and also of seeing him operate at the hospital under ether. He prefers to operate under local anesthesia by cocain and adrenalin in subjects over sixteen years of age. The patient is given a hypodermatic injection of morphine from one-half to three-quarters of an hour before he starts the operation. The surface of the tonsil and anterior pillar is brushed with powdered cocain. He then injects a solution of one-eighth of one per cent. of cocain, beginning high up in the soft palate and continuing down along the anterior pillar. Adrenalin chloride, 6 minims to the drachm, is then injected as was the cocain. The tonsil is grasped with a hook and with a sharp pointed bistoury Myles cuts through the plica, entering behind the capsule. Grasping the tonsil with forceps, he takes the Hurd semi-sharp spoon and dissects the tonsil from its base, slipping a snare over the forceps and tonsil and cuts through the pedicle. Carefully examining the wound, if he finds any bleeding points he grasps them with a long handled artery forceps. A powder consisting of aristol 30 grains and boric acid 15 grains is then blown into the tonsillar fossa. The patient is given an alkaline mouth wash to use at home. The operation under ether is as follows: The patient is thoroughly etherized, put upon his right side, the gag is introduced and with reflected light from a hand light and head mirror Myles grasps the left or uppermost tonsil with a hook and proceeds as in the local operation. After the removal of the left tonsil

he removes the adenoid tissue with Myles' and other small adenoid forceps, finger and curette. The patient is then turned upon the left side, and the right tonsil is removed in the same manner. If by chance he should leave a small portion of tonsillar tissue in the supratonsillar fossa it is removed with his punch forceps. He does a clean, deliberate, thorough operation in about fifteen minutes, using his finger freely. If I were to make any criticism it would be on his method of removing the adenoids, as we are still of the opinion that adenoids can be successfully removed with the sharp curette and finger, without the use of forceps. Personally, I prefer to remove the faucial tonsils before removing the adenoid tissue. In the use of the local anesthetic I can see no good reason for injecting the cocain and adrenalin separately and the morphine did not seem to augment the action of the cocain.

I am convinced from my observations of the various operators that the personal equation plays a very big rôle. One may use a tonsillotome and another a snare but both enucleate the tonsil with equal facility. My own method is to separate and cut the plica with a Leland knife, made a little sharper on the end, but not pointed. The finger is then introduced and if any adhesion or bands of plica remain I break them down. The tonsil is then pulled gently toward the median line with forceps. I believe that the wire will follow the path of least resistance more easily than a knife and the wire snare is therefore used. Preference being given to the Kratz-Muller or Peters, because it can be worked with one hand. I think that it is much safer to grasp a tonsil with forceps and pull it toward the median line than to push it toward the median line from without inward, at least there is removed the danger of dropping the tonsil into the larynx by the use of forceps. The question of the anesthetic is still worthy of serious consideration. I prefer to operate in the upright position under local anesthesia, when possible, but as yet I have not had the courage to etherize my patients and put them in the upright position.

Dr. Demarest and others use chloroform to the exclusion of ether, but I have not yet felt bold enough to give chloroform in these cases, although if administered by an expert and fresh from a container that has not previously been exposed to the air, it may be as safe as ether. My preference for ether, however, is based upon the opinions of many eminent rhinologists and others who condemn chloroform, and upon my own experience. It conduces to a sense of safety if the cough reflexes be present and the patient be not profoundly under the influence of ether.

If severe hemorrhages occur there are available many forms of hemostats, but the only surgical procedure is to catch the bleeding vessel with a pair of long hemostatic forceps and twist or ligate it. For this purpose Yankauer's instrument for tying knots after suturing the mucous membrane has been found to be amost valuable aid.

The method of illumination is a very important one. I believe the best illumination is to be found in placing the patient in an upright position before a window and to use the light of day. The next best is electric light, reflected from a head mirror. In the prone position I use the direct light from a 32-candle power electric hand light or have an assistant hold that light so in such a way that I can reflect it into the throat from a head mirror. I do not remove the second tonsil until after the first has ceased to bleed, thereby keeping the field comparatively free from blood.

Instead of taking five minutes to complete the operation as did most of the operators whom I saw, about fifteen minutes are consumed, and I have the satisfaction of feeling that my patients are not bleeding. I invariably inspect the wound before the patient is removed from the table, in order to be satisfied not only that it is not bleeding, but also that there are no tags of adenoid tissue remaining.

The sterile finger is a valuable aid not only for diagnostic purposes but also for separating the tonsil.

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THE SURGICAL SIGNIFICANCE OF NYSTAGMUS AND VERTIGO.

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Recent progress in clinical otology and surgery of the brain has been associated with a study of the complex sensory and motor reactions of balance and the factors of its control and judgment in disease. For the practical physician, nystagmus and vertigo are important symptoms of irritation due to labyrinthine involvement or of cerebellar disease. Destructive processes in the labyrinth, especially the semicircular canals, is indicated by typical alteration in muscle tone and in the facility with which the upright position is maintained either at rest or in locomotion.

A thorough comprehension of the clinical methods of eliciting nystagmus and tests for dis-equilibrium is important for the differentiation of the disease affecting the nerve terminals in the vestibule of the inner ear from cerebellar abscess or neoplasm. While the recognition of the typical motor reactions is not difficult, its interpretation is by no means simple, and we note a great deal of confusion even on the part of some aural surgeons who have devoted time and attention to the subject of labyrinthine reactions. One reason for this is the lack of a uniform basis of nomenclature and of designation of direction in nystagmus. Another, the necessity for reasoning out each labyrinthine action and, as it were, tracing it back to its ultimate cause. A similar difficulty formerly presented in the analysis of ocular palsies, for which we have at present definite criteria in the position of the double images. These can be registered on a diagram in a given case and the diplopia referred to this or that muscle without difficulty. A similar graphic representation of the labyrinthine reactions, particularly of nystagmus, would greatly simplify the interpretation of disease symptoms in otitis interna and cerebellar affections and lead indirectly to a more general and methodical use of the functional tests by rotation, caloric and galvanic stimulation, and balance measurement of the non-acoustic labyrinth. A brief description of these tests may now be given, preceded by some general consideration as to the function of balance.

The upright position of the body in man is preserved by symmetrical automatic innervation of both sides of the body. This is kept in reflex action by sensory impressions emanating from the skin, the various muscles, especially those of the eye-ball, visual impressions, and labyrinthine stimuli, all acting via the cerebellum and indirectly through the cerebral hemispheres, to regulate the tonus of the muscles and to vary the degree of innervation to any set. Our concepts of balance depend largely on our sensed relation to the known position of objects in the external world as indicated by observation and memory habit. We judge of verticality, for instance, mainly by comparison with our own sensation of position, and vicè versâ, aid our own conception of subjective verticality by referring to some traditionally vertical object in the outer world. In the same way we judge of motion and rotation to a large degree by comparing our position changes with those of objects in the external world, and conversely. Now, external motion is largely gauged by fixation sensations. Fixation for objects in regular successive motion or rotation before us represents a clonus with a rapid component of aiming, toward the source of moving objects, and a slow fixation swing back with the moving object. This fixation reaction is identical with the nystagmus observed in otitic disease and elicited by the various clinical tests. The rapid movement is the criterion of direction, and if we bear in mind that the direction corresponds with the source of apparent motion in the outer world, the point from which objects seem to proceed and to which we seem to turn, the interpretation of the data will be simplified.

Nystagmus in any given direction indicates, broadly, irritation of a semicircular canal corresponding in axis to that direction. The nystagmus may be spontaneous and depend on the irritation of disease, or it may have to be elicited by special forms of experimental stimulation; by rotation of the patient which supplies the normal, physiological, or "adequate stimulus" of endolymph motion; by galvanic irritation, or by caloric stimulation by means of cold, or less suitably, by hot water. Hyperesthesia and hyperactivity, irritation, may be inferred when the motor reactions, notably nystagmus, are excessive or are elicited by very slight stimuli, such as weak currents, one or two rotations on a revolving chair, and so on. Loss of labyrinthine function, such as is not uncommon in late stages of labyrinthine suppuration which has led to complete destruction of the nerve-terminals in

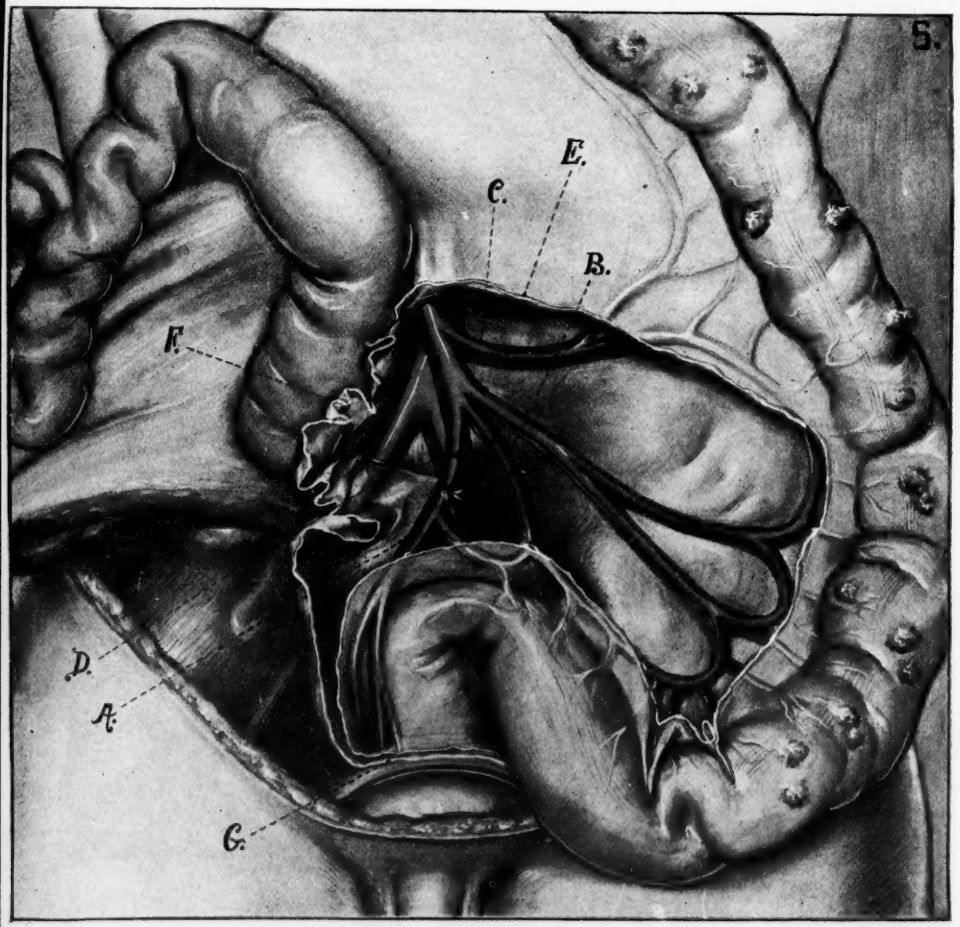

Fig. 2. Dissection showing peritoneum of the meso sigmoid (F) thrown back and the blood vessels exposed and ligated so that when they are cut between the two ligatures the sigmoid can be swung down on the upper vessels as radii, thus permitting the removal of almost its entire length along with the rectum, at the same time bringing the cut edges of the peritoneum (FE) together so as to restore the meso sigmoid.

(A) Superior Hemorrhoidal Artery. (B) Lower Sigmoidal Artery. (C) Left Colonic Artery. (D) Internal Iliac Artery. (EF) Cut edges of Peritoneum. (G) Incision of Peritoneum separating bladder from rectum.

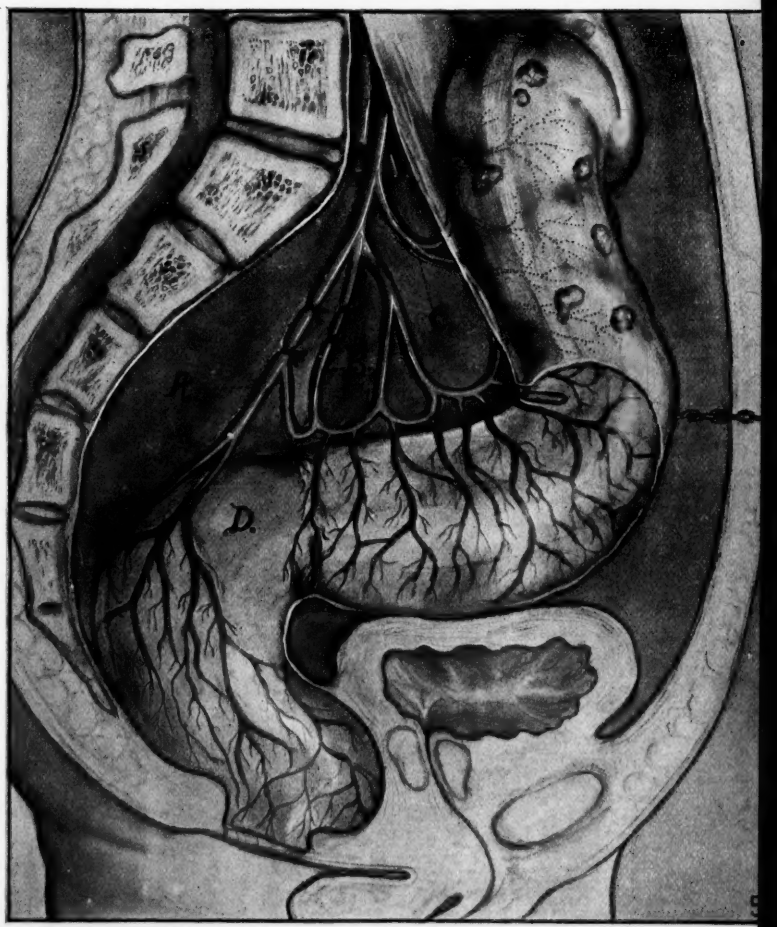

Fig. 3. Dissection showing arterial and anastomotic circulation of the rectum and sigmoid—also method of applying ligatures so as to preserve the blood supply to the rectum although cutting the superior hemorrhoidal artery. (A) Superior Hemorrhoidal Artery. (B) Lower Sigmoidal Artery. (C) Left Colonic Artery. (D) Portion of Sigmoid with very little blood supply.

the ampullae results, on the other hand, in total absence of nystagmus reaction to rotation, galvanism, and so on. It is evident that the labyrinth can be excluded as the source of any nystagmus which presents in such a case, thus allowing a diagnosis of cerebellar irritation, as by abscess, in old cases of labyrinthine suppuration in which nystagmus is spontaneous.

While the immediate object of elicitation tests for nystagmus is to determine whether the labyrinthine function responds to small stimuli or not at all, the conclusions throw light on other disease complexes as well.

In clinical otology special interest attaches to the external semicircular canal. Owing to its topographical relations, its proximity to the middle ear and the mastoid antrum, this canal, and especially its ampullar ends is frequently the seat of purulent infection which may lead to bone destruction and the formation of a fistula leading to the interior of the canal. This allows of the elicitation of a nystagmus reaction to compression or rarefaction of air in the external auditory canal and of the so-called fistula symptom. As the horizontal canal corresponds in function to sensations experienced in horizontal locomotion and rotation without change of horizontal plane, lesions may produce sensations of disturbed equilibrium which will naturally be referred to the horizontal. This is one reason why dizziness is generally felt by human beings as confusion of motion in a horizontal plane. It is quite possible that gymnasts, tumblers, and others who habitually rotate vertically have "somersault" dizziness. This actually does occur in animals, notably birds, who balance, not only for the vertical axis, like man in the erect position, but for deviations from the horizontal plane, as well. It is possible also that we have become accustomed to physiological balance as stimulation from the external semicircular canal and have many motor and sensory associations as well as psychical concepts in logical accord with the function which itself has grown more accurate with use, ontogenetically as well as biogenetically.

The vertical canals have little or no opportunity to exercise either a sensory or regulatory motor control, so that it would not be surprising if, even in the rare case of their involvement in labyrinthine suppuration, the sensation of dizziness should be interpreted according to its more active component, the horizontal canal. The same reasoning applies to cerebellar dizziness which, in as far as it depends at all on labyrinthine sensations, is developed, as a central organ, mainly by external canal stimulation.

The term vertigo, indicating rotational dizziness, aptly fixes this connotation, but it should be borne in mind that dizziness sensations are, at best, vague and defined with difficulty on account of the attendant disturbance of general consciousness.

CLINICAL TESTS OF LABYRINTHINE FUNCTION.

Labyrinthine Nystagmus. Irritation of a single semicircular canal causes a definite motion of the eyes. If the irritation continues, a clonic spasm takes the place of the single muscular contraction. After destruction of the labyrinth there is neither nystagmus nor vertigo on rotation, pneumatic or caloric stimulation, or other local irritation, and this is noted in a large percentage of deaf mutes, in whom it is inferred that both labyrinths are degenerated. The fixational nystagmus or nystagmoid twitch of otitis and cerebellar disease has a rapid component toward the side of irritation or disease and a slow swing in the opposite direction, the former indicating the direction of the nystagmus and the side stimulated.

The eye motion resembles the twitching effort seen in forced abduction of even normal eyes and more strikingly seen in paresis of normal eyes and more strikingly seen in paresis of an external rectus muscle. The motion is either right, left, or occasionally circular instead of straight, but vertical oscillations are almost unknown. This nystagmus becomes more marked in looking toward the irritated canal or diseased side and diminishes when looking away, toward the sound side. This may be used to aid us in accentuating small degrees of nystagmus for clinical examinations. In fact, labyrinthine nystagmus may be so slight as to appear only in forced abduction in the rapid direction, i. e. to the diseased side. The individual excursions are usually small and rapid. They may have to be studied with special illumination and a magnifying glass, and at times can be seen only on close inspection while the patient fixes on object far to one side. Spontaneous labyrinthine nystagmus is a symptom of labyrinthine irritation and is directed to the diseased side. It may be assisted by holding the head low and thus causing labyrinthine hyperemia.

In marked conditions of irritation nystagmus may be caused by simply turning the head, which is quite unusual in health. This elicitation of labyrinthine nystagmus by slight stimuli or in the form of excessive reaction to medium or physiological stimuli indicates a labyrinth in function and irritated. We are thus enabled to determine the character and to a certain extent the amount of function in either labyrinth. As these reactions can be valued only by comparison with physiological reactions we should have a definite idea of the latter in their relation to the usual

clinical tests. Much still remains to be done in this field and we still know very little about the possible variations within normal limits to rotation and mechanical stimulation of the labyrinth, the individual or personal equation, the effect of habit, or left- and right-handedness, or special occupations and avocations, such as dancing, skating, riding, and and so on, and the direction of reversing. The comparative ease or difficulty with which we turn to the left or right, respectively, may have a bearing on the subject, as well. Still, fairly definite data have been gained as to the significance of the most striking labyrinthine reactions, and the comparison with conditions in health will be given in each set of tests, as far as it is of practical importance.

Rotation Tests. Active rotation, as in whirling, or passive rotation on an ordinary piano stool causes nystagmus in the direction of turning. Sudden stoppage produces a secondary nystagmus in the opposite direction with dizziness and a sensation of falling toward the same side as the nystagmus. Thus after cessation of right rotation, there is a nystagmus to the left, sensation of falling to the left, and a strong muscular corrective action tending to turn the entire body and head to the right. This may be so sudden and violent as to cause actual loss of balance. The reaction just noted is normal under certain conditions. Thus, after ten continuous and fairly rapid turns, according to Barany, nystagmus develops and lasts for forty seconds. It may be intensified by the patient looking in the direction of rotation, or in the opposite direction after stopping. Absence of nystagmus or only brief duration indicates loss of function in the corresponding semicircular canal, such as is not infrequently found in late stages of labyrinthine suppuration, as a permanent condition in many deaf-mutes, and so on. Excessive or prolonged nystagmus, coming on after only two or three turns in the chair, and associated with marked vertigo, indicates morbid irritability of the labyrinth, which may be due to a local process in an early stage. The presence or absence of nystagmus on rotation thus enables us to include or exclude the labyrinth as a source of the ocular reaction and indirectly to differentiate between otitic and cerebellar nystagmus. A spontaneous form presenting while the rotational form cannot be elicited must logically be attributed to a central, *i.e.*, cerebellar, irritation. Conversely, nystagmus which is not spontaneous, but must be elicited by rotation, is almost necessarily of labyrinthine origin. It is very difficult to control or to watch the nystagmus during rotation unless we revolve with the patient, and, as has been suggested, keep the forefinger tips on the patient's closed lids to feel the motion of the globe beneath. This is scarcely feasible. We can do better by observing the after-nystagmus on stopping rotation which is just as uniform, much more easily observed, and directly proportional to the primary reaction. Rotation about a vertical axis, as in ordinary revolving chairs or piano stool, in the horizontal plane, brings into action the external horizontal canal of both sides and serves as a test of their function.

To test the vertical canals without the more accurate tests of complicated apparatus revolving about a horizontal axis, either frontal or sagittal, we may have the patient incline the head forward on the breast or backward, with extension of the neck, at an angle of 90° with that usual in sitting. This has exactly the same effect, as far as the individual canals are concerned, as the vertical rotation we cannot well produce clinically. Forward inclination of the head during rotation brings into action the vertical posterior canal of the opposite side and the anterior canal of the corresponding side, while backward inclination of the head, conversely, enables us to test the other associated pair, namely, the posterior canal of the homonymous side and the anterior canal of the crossed side.

In case of unilateral loss of labyrinthine function the opposite side which under normal conditions produces a weak reaction which is overbalanced, gives its characteristic reaction. Thus loss of function in the right external canal is followed by loss of rotational right nystagmus and of the usual after nystagmus (secondary nystagmus) to the left on stopping, but continued rotation eventually produces a weak but evident reaction from the left labyrinth expressed as a primary nystagmus to the left or sound side and a secondary nystagmus, as usual, in the reverse direction, *i.e.*, to the right or paralytic diseased side.

The subjective sensations in rotational vertigo and the disturbance of equilibrium associated with it can best be tested by having the patient stand up and try to walk in a straight line after rotation has ceased. Secondary nystagmus may be intensified by having the patient look away from the direction of previous turning, as by fixing the finger of the examiner held to the left, about 16 inches from the eyes, after right rotation.*

* *Ocular Torsion.* Wheel motion of the eyes or alteration of the vertical meridian, manifesting itself as an inclination of the cornea, a torsion about the antero-posterior axis of the eye, compensates for head tilting and persists until the vertical position is again assumed. It must also be considered as a labyrinthine reaction for all but the smallest angles of inclination, including, therefore, all which are large enough to enter into consciousness as alterations of balance or verticality. After destruction of both labyrinths in animals this torsion does not take place, while it is markedly diminished in deaf mutes and in bilateral destruction of the labyrinth in normal subjects. In unilateral irritation, there is no alteration, but when both labyrinths are involved there is decided increase of compensatory ocular torsion. In normal subjects a tilting of the head of 60° corresponds to ocular torsion of 4° to 16°.

Spontaneous Nystagmus. This is a symptom of labyrinthine irritation and is frequently directed to the sound side. It may be accentuated or elicited by having the patient keep the head lowered for a minute or two, thus producing labyrinthine hyperemia. This reaction is still further increased by turning the head in either direction once or twice or by inclining it toward the shoulder, especially toward the diseased side, and having the patient fix in the opposite direction.

Caloric Nystagmus. If the ear be irrigated with water above or below the body temperature, nystagmus is produced which is more marked as the temperature contrast increases, and ceases when water of an indifferent temperature is used. Hot water acts as an irritant, *i.e.*, as a stimulus corresponding to rotation to the tested side, and produces exactly the same motor reactions, (nystagmus, head and body turning) as well as sensations. Cold water acts as a depressant with a diminution of sensation of turning toward the tested side, or what amounts to the same thing when the body is at rest, a resultant sensation of motion to the opposite or non-tested side.

After destruction of the labyrinth there is loss of caloric reaction and as this test enables us to test each labyrinth separately, in contradistinction to the rotation tests, we have in caloric nystagmus an accurate criterion of presence or absence, and even to a certain extent of the amount, of function in either labyrinth.

Loss of caloric reaction in the presence of spontaneous nystagmus would indicate that the latter reaction was due to cerebellar irritation; a point emphasized by Barany.

Spontaneous nystagmus increased by caloric irritation or elicited by it with slight stimuli would show an irritated labyrinth, while the previous reaction indicated one whose function had completely disappeared.

Barany has worked out the contrasting reaction to heat and cold on an anatomical-hydraulic basis of the planes of the various canals, the height of the ampulla as compared to utriculus and canal bore, and other data which greatly complicate matters. It suffices to remember as just stated that heat acts as a stimulus to the labyrinth of the tested side, while cold gives a reversed reaction. For practical clinical purposes, however, we use only the reaction with cold water as a contrast of 30° below body temperature, *i.e.*, 70° F. can be applied without marked discomfort to the patient.

Technic of Caloric Test. A large amount of water under very low head, an even stream of long duration, and as little mechanical irritation as possible, is what we need. Ear or piston syringes of any kind are absolutely unsuitable. We may use a large Politzer bag or a fountain syringe hung only a few inches higher than the ear. A fine glass ear irrigating tip or, better still, a delicate elastic middle ear catheter, cut off short, should be introduced through an ear speculum and carried close to the drum, an assistant managing the water supply while the surgeon observes the eye reaction. This generally appears in from one to two minutes when the drum is intact, but where there is a perforation the nystagmus develops almost immediately and lasts for several minutes.

Galvanic Nystagmus. Electric stimulation of the labyrinth causes nystagmus. The reaction can be prevented by cocainization of the labyrinth, disappears after bilateral destruction of this organ, and is absent in deaf mutes. All these facts exclude the possibility of cerebellar participation in the galvanic reaction. Current closure with the cathode on the tested ear acts like hot water, *i.e.*, as an irritant to the tested side or like rotation toward it.

Nystagmus, as in all such irritation, is toward the tested, irritated, or diseased side. Anode closure on the tested ear, conversely, acts like cold water, and is similarly followed by nystagmus to the opposite side. In practice, the cathode is used exclusively, being placed on the tragus of the ear to be tested, while the anode is held in the opposite hand. Nystagmus is accentuated by looking toward the cathode, *i. e.*, the source of irritation, of apparent external motion, and of sensed rotation, as in all previous reactions. It can be elicited with currents of 2-6 milli-amperes, while with the gaze directed away from the cathode, 10-15 m-a. are usually required.

After long continued labyrinthine suppuration it may be impossible to elicit galvanic nystagmus from the diseased side, a complete analogy with caloric nystagmus.

Babinski's "Ear-Phenomenon" is a characteristic head rotation on galvanic stimulation of the diseased labyrinth, whether by cathode or anode, consisting in an invariable turning of the face toward the diseased side, and always indicating unilateral disease of the static apparatus (sensory terminals in the vestibule proper, *i. e.*, utricule and saccule.)

Tests of Equilibrium. V. Stein distinguishes between static and dynamic balance. For the former he uses a movable inclined plane on which the patient stands. The angle of inclination is then increased until the patient loses his balance. Tests

with this goniometer show that in the upright position normal subjects can be tilted backwards 36° to 39°, forward 26° to 30°, and tipped sideways 36° to 38° degrees, before they fall. When the eyes are closed the angle is 3° to 4° less.

Dynamic tests note the variation from a straight line and the tendency to fall in a certain direction when moving in various modes of locomotion. The difficulty of preserving balance and direction increases as we proceed from standing to walking or hopping; from the flat foot position to tip-toe; from a support on both feet to a single point d'appui, and still more by closing the eyes and by moving backward. By these progressive tests v. Stein and others claim that it is possible to detect slight disturbances of equilibrium which would otherwise escape observation, especially where the patients themselves are not conscious of them.

In simple clumsiness or lack of practice, any defect of static balance will be the same on both sides, while in the labyrinthine affections there is marked asymmetry.

The following phenomena are characteristic: 1. The affected side is the weaker. In standing or sitting the body inclines or falls to the diseased side. In walking or hopping there is a deviation to the diseased side, the patient does not stand securely on the leg of that side, and the body can be more easily pushed to that side.

2. The body muscles tire rapidly, so that in hopping, the jumps not only deviate from a straight line, but the distance between them becomes smaller and smaller, until finally they "mark time," and are made on one spot. (Labyrinth hops of v. Stein.)

3. Falling can be prevented by merely giving the patient a finger, as the slightest tactile sensations will compensate for the labyrinthine defect.

4. Falling is sudden, unexpected, and complete. The patient collapses, "like a log," without regard for possible injury and without power of preventing or compensating the loss of balance, so that the necessary precautions to guard against injury to the patient should always be taken by those who institute these tests.

Finally it may be noted that tests with the dynamometer, the ergograph, and other instruments of precision show a decrease of muscular energy, tone, and muscle sense, with characteristic curves in labyrinthine disease which correspond closely to the data of animal experimentation.

NON-ACOUSTIC SYMPTOMS OF LABYRINTHINE DISEASE.

1. *Circumscribed Labyrinthitis* (Otitis interna circumscripta).—Symptoms due to irritation by hyperemia or toxic edema. Spontaneous nystagmus at intervals, elicited by head motion to diseased side, accentuated by lowering of head, and active fixation toward diseased side. *Caloric* test positive. *Rotation* to diseased side accentuates or brings on nystagmus after one or two turns. *After-nystagmus* is to sound side but slight. *Disturbance of Equilibrium.* Head turns away from diseased side and when head is upright, patient falls away from diseased side. (attempted compensation). With head turned to diseased side, patient falls backward, and vicè versâ *Tonus* increased on diseased side. Fistula symptom (nystagmus on air compression) may be elicited. Marked vertigo, nausea, and vomiting. Deafness for certain tones, only. Many diseases, notably circumscribed, acute labyrinthine suppuration, and fistula, show this reaction. Recovery with normally irritable static apparatus.

2. *Diffuse Labyrinthitis.* (O. I. P. Acuta.) Loss of function due to acute and wide-spread suppuration. Spontaneous nystagmus to sound side due to comparative excitation of normal opposite labyrinth and complete loss of function on diseased side, is continuous and present in all positions, but tends gradually to disappear. Tinnitus and spontaneous nystagmus occasionally persist for some time. *Rotation* to diseased side causes slight somatic reaction, if any, but there is marked after nystagmus to the sound side. *Caloric Reaction,* absent. *Galvanic Reaction,* absent. Vertigo and nausea slight; often absent. *Disturbance of Equilibrium.* Patient falls or walks toward diseased side. This is gradually corrected by vision and tactile sense. *Tonus* markedly decreased on diseased side. Total deafness. Facial paralysis frequent. Recovery with unilateral loss of static function and absence of reaction to rotation.

3. *Chronic Diffuse Labyrinthitis.* (O. I. P. Chronica). Loss of function following previous suppuration. Spontaneous nystagmus to sound side no longer present, but after-rotation it is marked. *Caloric,* galvanic nystagmus, and fistula symptom and vertigo absent. *Balance* and tonus gradually restored, but muscle weakness tends to persist. These reactions may be noted in cases which have progressed slowly, with a sub-chronic course, from the start, nystagmus and vertigo never having been noted, as well as in typical cases of labyrinthine suppuration with widespread destruction, of long standing.

PERFORATION IN TYPHOID FEVER.*

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A fairly recent experience with a case of intestinal perforation in typhoid fever, added to a slight experience with the same subject acquired while a hospital interne, has led me, more than ever, to appreciate the difficulties connected with making a diagnosis of perforation in typhoid; and it occurred to me that perhaps the result of some study of the subject might be of interest, in view of what might almost be called an epidemic of typhoid fever which existed here a few months ago.

The subject is one of great interest to the surgeon and no less to the general practitioner, who may be called upon at any time not only to diagnose a condition of perforation, but also to operate in the event of not being able to secure the aid of a surgeon.

It has been estimated that about seventy-five thousand deaths a year from typhoid occur in the United States alone, and about one-third, or twenty-five thousand, of these deaths may be attributed to perforation. Scott[1], in 1907, reviewing a series of cases treated at the Pennsylvania Hospital from May, 1901, to February, 1907, found that in three thousand and six cases there were two hundred and forty-two deaths; that is, a general mortality of 8.05% and a mortality from perforation of 2.59%; and he concluded that "in a little over every three cases one perforation occurred." In this series of eighty-four cases of perforation, sixty were operated upon, with thirteen recoveries—a little over one-fifth of the cases recovered. Allaben[2] in 1907 collected, as far as possible, all cases operated upon from January, 1903, to January, 1907, and found a total of one hundred and sixty-two cases, with a mortality of 62.34%. This reduction of the operative mortality rate within recent years is undoubtedly due to a keener sense of the necessity of an early diagnosis and a better knowledge of the conditions existing in perforation.

Twenty-five years ago Mikulicz first operated for this condition, which up to that time had been regarded as hopeless. While there has been, it is true, an occasional recovery from perforation without operative interference, the chances of such recovery are so slight that they may practically be disregarded in any consideration of the subject. It will thus be seen that perforation still claims about one-third of the deaths in typhoid fever, and that in spite of the fact that the operative mortality is 62.34%.

The perforation may be very small, almost pinpoint in size, or it may be much larger, involving the entire Peyer's patch or solitary gland which forms the typhoid ulcer. It may be round, oval, slit-like or cubic form. Usually it is situated in the free border of the intestine; occasionally it is situated at the mesenteric attachment and causes retroperitoneal abscess[3]. According to Finney[4], it is three times as frequent in males as in females, "is usually single, but may be multiple," and in 80% of the cases occurs in the last two feet of the ileum, in more than 12% in the large intestine, and in the appendix vermiformis in about 5% of all cases. Keene concluded that when no perforation was found in the ileum, cecum or appendix, "the next most likely place was the sigmoid flexure."[5] In Scott's series of cases, above referred to, perforation occurred during the third week in thirty-eight of the cases and during the second week in eighteen of the cases and the remaining twenty-eight cases were variously distributed through the first, fourth, fifth, sixth and seventh weeks. Thus it is most common in the third and second weeks of the disease, but may occur earlier or later or during a relapse. In over three-fourths of the cases there is no hemorrhage.[1] The mildness of the disease is no bar to this complication, for it exists in the ambulatory form as well as in the most septic.

Let us now consider in detail the symptoms of perforation, for it is only by a most careful study of its symptomatology that we can hope to arrive at an early diagnosis of perforation in typhoid fever; and let me try to emphasize the fact that the earlier the diagnosis, the better the chance for the patient's recovery. We must not look for symptoms of a general peritonitis, for when that stage has been reached the patient's chances of recovery are very slight, indeed. The greatest percentage of successful operations have been done within the first twelve hours after perforation. The situation was rather aptly put by a friend of mine, who once said: "I sat by the patient's bed all night, trying to make up my mind whether or not he had perforated, and in the morning I knew that he had, but I also felt that my knowledge had come too late to save his life."

The symptoms depend largely on the severity of the typhoid's sepsis. In the mild cases we find the

* Read before the Plainfield Medical Society, April 1, 1909.

most characteristic symptoms of perforation. In the severer cases, owing to the clouded sensorium, the symptoms are more or less masked, and in the severest cases, usually those in coma, a perforation may go unsuspected to the autopsy table.

In the majority of cases there are three symptoms on which we can place reliance—first, *abdominal pain;* second, *localized tenderness;* and third, *rigidity.* The pain is present in 75% of the cases, and in 50% of the cases its onset is sudden and severe[6], is apt to be paroxysmal, gradually becoming localized. It is often severe enough to cause the patient to cry out. Blake[7], writing in 1907, said: "If when a patient complains of pain we examine the abdomen and find that it is tender over the usual site of perforation, namely—the lower right quadrant, and that, in addition, there is some rigidity of the abdominal muscles, the diagnosis is sure enough to warrant operation."

One or more of these three symptoms may be absent; the pain may be very slight and gradual in its onset and it may disappear; the tenderness may be slight and it may have been present at various times during the course of the disease; the rigidity may be difficult to recognize and may be masked by a distended abdomen. Fortunately, there are other signs and symptoms which may aid us in arriving at a diagnosis. There is very apt to be a change for the worse in the patient's condition, amounting in some cases to *shock,* and this is often denoted by an *anxious facies.* Here the physician regularly in attendance on the case has the advantage over the consultant, for he it is who is able to determine this change; and for this reason some writers have recently urged that typhoid fever patients, particularly those under hospital treatment, should be seen at regular intervals by the attending surgeon during the course of their disease, in order that in the event of a question of perforation this change in appearance may be duly noted. On this score Blake[7] says: "I find that when I have not been to see a patient before perforation is suspected, the diagnosis is extremely difficult, and that I have to be largely led by the observations of the medical attendant in regard to the changes that have taken place in the patient's condition."

The *pulse* may be increased in rate, or there may be a change in *temperature;* most often there is a marked fall in temperature to normal or lower, occasionally a rise. It is advisable in a suspected case to take the temperature hourly. The *liver dullness* may be obliterated, but this is not always a positive sign, for a distended colon may mislead us. A rising *leucocyte count* may be confirmatory. A rectal examination should always be made, for an area of tenderness may thus be demonstrated which would have gone unnoted by abdominal palpation. The symptoms of hiccough, vomiting and marked distension are more apt to be those of the general peritonitis than of the perforation. In the *Journal of the American Medical Association,* May 9, 1903, Crile[8] reported a rise of *blood pressure* in five cases of diagnosed perforation in typhoid. He found that in one hundred and fifteen uncomplicated cases the mean blood pressure for the various weeks was as follows:

First week, 115 mm. of mercury.
Second week, 106 mm. of mercury.
Third week, 102 mm. of mercury.
Fourth week, 96 mm. of mercury.
Fifth week, 98 mm. of mercury.

He also found that in twenty cases of acute peritonitis (using the same instrument, a Riva-Rocci) the blood pressure ranged from 156 to 208 mm. of mercury. In his five cases of perforation in one the blood pressure rose from 105 to 190 in four hours; in another he noted a change from 84 to 110 mm.; in still another from 116 to 165 mm. in two hours; in a fourth a pressure of 165 mm., and in the fifth of 208 mm. of mercury. Since then other observers have confirmed these findings. It would seem advisable that the blood pressure should be carefully noted every few days during a case of typhoid, and in the event of perforation being suspected it should be frequently measured in order to determine whether or not there is a sudden rise. Janeway[9] says: "Since the differential diagnosis of perforation is always difficult, and the other accidents which come in question, concealed hemorrhage and acute collapse, produce a fall, this sharp elevation of pressure may often be of inestimable value." Recently Brown[10] has described two new signs of perforation in typhoid. The first he designates as the *"dipping crackle,"* and it is to be heard by placing the bell of the stethoscope over the right iliac fossa and "dipping" suddenly with it, when a sound like a fine crepitant râle will be heard. This he found in seven cases—never over an area greater than two inches in diameter and not later than four hours after perforation. His second sign is as follows: An area of tenderness in the right iliac fossa having been found, the patient was placed on his left side and in a half hour the area of tenderness had moved

toward the left about two inches. He claims that *the area of tenderness moves* in a short time with the position of the patient.

It is thus seen that in the event of the absence of the syndrome of pain, tenderness and rigidity there are other signs which we may rely on to help us in arriving at a definite conclusion in regard to perforation in typhoid. And none of the minor aids to a diagnosis should be disregarded, for, with the exception of mild cases, where the onset is sharp and with pathognomonic symptoms, the diagnosis is in the majority of cases extremely difficult, and yet it must be made early in order to save life. It is far better in a case where the diagnosis is uncertain, but most suspicious, of perforation, to open the abdomen under either ether or local anesthesia than to defer an operation until the chances of saving the patient are small. Fortunately, statistics show that typhoid patients operated on and no perforation found stand the operation well. Finney[4] says: "It is a satisfaction to know that if, in the effort to forestall the development of this condition, we operate before perforation has actually taken place, as has been done in several instances (Cushing, Herringham and Bowlby), no harm is likely to come of it, as the cases in which such operations have been performed have invariably recovered."

Before reaching a definite conclusion as to the presence of a perforation in typhoid, we must exclude several other conditions which may closely simulate it, and chief among these is a lobar pneumonia or diaphragmatic pleurisy. Hemorrhage, with its fall of temperature, may confuse us, but blood will soon be noted in the stools. Other conditions from which it must be differentiated are acute intestinal indigestion, the passage of a renal calculus, iliac thrombosis, appendicitis, a distended urinary bladder, cholecystitis and rupture of the gall-bladder[12], a broken-down mesenteric gland, intussusception, and lastly, an interesting but rare condition—hemorrhage into one of the abdominal muscles, which may follow Zenker's degeneration, and which is apt to occur in the lower half of the rectus abdominis, and go on to suppuration.

The scope of this paper will not allow of my going into any consideration of the treatment at length, but the diagnosis having been made or strongly suspected, operation is imperative, and that as quickly as the patient can be placed upon the table and the operating room prepared. There should be no necessity for delay in awaiting consent for operation: the typhoid when admitted to a hospital or his nearest kin should give permission for operation in the event of its becoming necessary for this condition. Shock, if present, is no contraindication to operation, and Blake[7] thinks that the shock which is present is due to peritoneal irritation and this is diminished or stopped on the administration of an anesthetic. Certainly, these patients stand ether well. Some surgeons prefer local anesthesia. No case is too desperate to be operated upon, and it is interesting to note that an Australian surgeon, Rennie, in 1907 reported a case[11] of a woman three months pregnant who was operated upon twenty-four hours after perforation, and who recovered and at term was delivered, without difficulty, of a normal child.

The operation should be done quickly but thoroughly. The incision should be large and preferably through the right rectus, the perforation found and closed, and others sought for. In the event of not being able to close the perforation by a purse-string suture or series of sutures on account of its size or the extent of the bowel involved, it is better to bring the portion of gut into the wound and allow a fecal fistula to form than to attempt resection, as these cases stand such an operation poorly. The treatment of the peritoneal cavity will depend on whether one is a follower of the Murphy method or not. It seems to me a rational treatment where fecal matter or foul pus is present to irrigate all parts of the abdomen with hot saline solution, preferably through a two-way tube such as is used by Blake, and to drain through the peritoneum and down to the site of perforation. A modified Fowler position afterward seems best, as these patients have been used to a low position of the head. In the after-treatment the Murphy method of saline installations per rectum has given most excellent results.

The following case of perforation terminated unfortunately, but nevertheless it illustrates the difficulties attending the diagnosis, occurring, as it did, in a patient suffering with a severe typhoid septicemia:

The patient, a man of twenty-seven, lawyer, came under my care on October 19, 1908. He was suffering with an undoubted typhoid, and the following day I had him moved to the Muhlenberg Hospital.

He continued with a severe typhoid fever, was very septic, and the baths did not effectually control his nervous symptoms. He was frequently irrational and subsultus tendinum was present. He had considerable abdominal distention. On October 31, the eighteenth day of the disease, he complained of some pain in the bladder region, after

his noon tub, and the nurse immediately sent for me. I found his general condition fairly good; temperature 101.2°; respiration 26; pulse 112. His abdominal distension was about as usual; there was no marked tenderness and no rigidity. But he still had some pain in the lower part of the abdomen, and I thought he *looked* a little anxious. Leucocytes 6,000. In view of the sudden onset of the pain and his general appearance, I at once thought of perforation and called Dr. B. Van D. Hedges in consultation. We concluded that his condition was suspicious and that he must be closely watched. Tubbing, of course, was stopped. At 10 p. m. his general condition remained practically the same. Tenderness could not be elicited. There was no rigidity. Rectal examination, negative. Liver dullness was slightly obliterated, but the patient was quite distended. Leucocytes 8,200. Lungs, negative. He had less pain. At midnight he vomited some greenish fluid. Enema was returned with fecal matter and a large amount of flatus. But his temperature was 100.8°; respiration 26, and pulse 116, and the notes read "of good force." Shortly after this he went to sleep and rested quietly until 5:30 a. m.—apparently no pain, no tenderness and no rigidity.

At 6 a. m. his temperature was 98.6°, respiration 28 and pulse 104, but he was again complaining of abdominal pain. Leucocytes 4,500. There was slight tenderness and some rigidity of lower part of right rectus. Consultation shortly after with Dr. Hedges; the patient's brother, a physician, was also present. In view of the sharp fall in temperature and other symptoms, it was decided that the most probable diagnosis was perforation, and operation was shortly after performed by Dr. Hedges.

Under ether anesthesia an incision about four inches long was made through the lower part of the right rectus muscle. On opening the peritoneal cavity, fluid feces were seen and there was found a perforation, which was round and about the size of the head of a pin, in the center of an ulcer about the size of a quarter. It was situated in the free border of the ileum, about eight inches from the cecum. No other perforations were noted for a distance of three feet along the ileum. The appendix appeared normal. There was considerable plastic exudate on the intestines in the neighborhood of the perforation. This was closed with a purse-string suture and the peritoneal cavity was flushed out with hot saline solution. There was very little injection of peritoneum except in the immediate region of the perforation. The wound was closed in layers and a cigarette drain was left in the lower angle extending through the peritoneum.

The patient stood the operation very well. He was placed in the Fowler position, with saline installations per rectum. He did fairly well for forty-eight hours and then went on with progressing symptoms of a general peritonitis. On November 4, three days after the operation, his distension became sharply defined in the upper half of the abdomen, not being relieved by irrigations or lavage, and, vomiting becoming more marked, a possibility of kinking of the gut was thought of, and Dr. Hedges made an exploratory incision under cocaine anesthesia in the right upper quadrant of the abdomen. The small intestines were not distended, however, and distension was evidently due to paresis of large intestine. Some foul pus and adhesions were found high up in the abdominal cavity. A cigarette drain was inserted. The patient's condition was very poor, but the exploratory incision was made with ease under local anesthesia. The patient died twenty-four hours later with general peritonitis.

The case shows the difficulty of diagnosis in the presence of typhoid sepsis. It was very difficult to elicit tenderness and rigidity appeared late. Pain disappeared for a while and the patient was apparently comfortable and better. Leucocytosis did not help us. The points which finally led to a decision for operation were the sudden fall in temperature added to the previous symptoms plus a facial expression which made us think the patient was getting worse.

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28 WASHINGTON AVENUE.

GASTRO-COLIC FISTULA DUE TO CARCINOMA: OPERATION. A CASE REPORT.

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I report this case for record because of the infrequency of its occurence. Originally there was no externa communication through the skin, but the contents of the transverse colon and the stomach were diffused in the tissues of the abdominal wall. Later it was made to communicate externally by puncturing the skin.

Deaver and Ashurst, in their *Surgery of the Upper Abdomen*, Vol. I, page 436, report that Lieblein and Hilgenreiner, in 1905, recorded ninety-five cases of this form of internal gastric

fistula. Forty-seven of these cases, according to Chavannaz, were due to carcinoma, thirty-eight to gastric, and six to colic cancer.

General History. On June 28, 1909, I saw the patient in consultation with Dr. G. E. Howe of a neighboring county. I found the following: I. D., White, male, 77, well nourished, abdomen fleshy, contour of the body well preserved, slightly pale, pulse and respirations normal. In 1899 patient was poisoned by eating canned clams (?). For one year thereafter he was unable to take solid food. No history of vomiting blood; pain and slight distress when solid foods were ingested; lived for one year on a prepared food. Recovery was apparently complete, although there is a history of increasing constipation and indigestion, and a gradual loss of strength. For ten years subsequently he performed all the arduous duties of conducting a large ranch.

Present Illness. Present trouble dated back about four months prior to June 28, 1909. At this time the patient fell, injuring his left hip and receiving a violent blow in the pit of the stomach. He attributes the beginning of his present ailment to this fall, although he was only temporarily incapacitated. Two months prior to June 28th he began to suffer more or less distress from gas and constipation. No particular pain except from the increased tension of the bowel and the increasing constipation. For the past two months he lived on an exclusively milk diet. There were frequent watery stools, with a considerable amount of black blood in each, but, during the whole two months, there was no history of any satisfactory or large fecal evacuation. No history of vomiting.

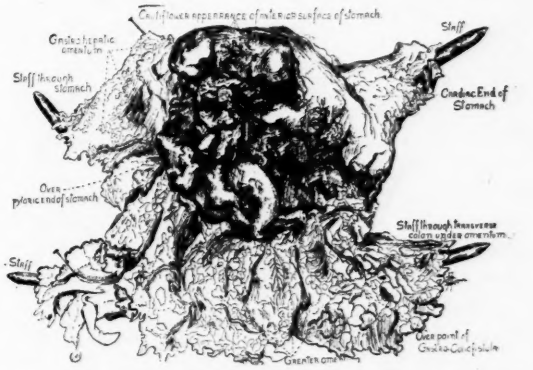
Local Examination. The whole abdomen very tense and tympanitic. Hard, indurated, immovable mass about three inches in diameter above and to the left of the umbilicus; the impulse of the abdominal aorta was pronounced even through the enormous distention.

Examination by Sigmoidoscope. With Tuttle's illuminated sigmoidoscope there were found small, ecchymotic, bleeding ulcers as far up as could be seen, due, no doubt, to pressure from above.

Diagnosis. A diagnosis of carcinoma of the transverse colon with fecal impaction was made provisionally until an exploratory incision would reveal the exact nature of the disease and the organ affected. Dr. Howe had previously stated to the relatives that the ailment was malignant and subsequent developments fully confirmed his judgment.

Treatment. Temporary. Through a fourteen inch sigmoidoscope an enema of eight ounces of olive oil was given. High enemas were recommended until the tympanites and the impaction were relieved, preparatory to an exploratory incision. After two or three days the patient had several large copious stools and thereafter he remained comparatively free from tympanites and impaction.

Exploratory Operation. On July 8, 1909, the patient came to the hospital with temperature 102°, pulse 130 and feeble, great pain in the abdomen over the indurated mass; no tympanites. Distinct fluctuation had developed over the mass. An examination by the sigmoidoscope showed all of the ecchymotic and bleeding ulcers to have disappeared. On July 9th, with the assistance of Dr. Howe and



Anterior surface of stomach, showing complete carcinomatous destruction. Omentum thickened and gastro-colic omentum obliterated. (Author's case).—Half natural size.

Dr. H. A. Compton, an exploratory incision was made at the outer margin of the left rectus muscle. Dissection was made through the thick layer of fat down to the subcutaneous fascia. In making blunt dissection with the finger the fluctuating mass was opened and eight to twelve ounces of foul pus escaped, followed by a dark brown fecal material. Upon exploring the cavity it was found to extend behind both recti muscles above the umbilicus to the outer margin of the right rectus muscle. On account of the foul character of the pus and discharge it was thought best not to extend the incision into the abdominal cavity. A large counter incision was made at the outer border of the right rectus muscle, and a large drain inserted.

Subsequent History. Improvement was very rapid for the first two or three weeks. The operation wounds granulated rapidly; appetite for solid foods returned and was satisfied; the bowel movements became normal and regular. The induration

increased, however, and there was a bulging between the two exploratory incisions. One of the initial wounds opened up slightly and began to discharge fecal material. In order to secure better drainage and more direct dressings, the skin was punctured directly over the center of the induration. After three or four days fecal material and gas began to be discharged through the central incision, the other closing very promptly. The patient improved in strength and appetite; the bowels were very regular, giving no distress whatever. Three or four days after leaving the hospital Dr. Howe reported that the gastric contents discharged directly through the cutaneous opening. By careful packing and judicious care, the cutaneous opening soon granulated over and the discharge of the stomach and bowel contents ceased. In the meantime the patient gained steadily in strength and was able to be up and about his premises with comparative comfort. He could take one or two fairly good meals of solid food each day. This continued for three or four weeks when again the central opening and the original incision in the left side re-opened and the gastric contents began to discharge, and continue to do so. The induration increased in size although the bowel movements were never again materially interfered with. Curetting the central incision and systematically packing gave some comfort but the downward course continued until the whole surface beneath the skin became greatly involved. The constant discharge of food a few minutes after taking, began to seriously impair nourishment, and the patient began to suffer from vertigo. The frightfully foul taste that was constantly present in the mouth completely destroyed his desire for food. Life became unbearable and he demanded that some radical means be taken to give him relief.

Radical Operation. With the assistance of my colleague, Dr. H. A. Compton, a radical operation was undertaken. A median incision was made through the abdominal wall one inch below the umbilicus. No adhesions being present at this point an upward dissection of the adherent organs was undertaken and comparatively easily accomplished. The whole anterior surface of the stomach was adherent, each of the isolated portions of the cancerous organ acting as a tentacle that had fastened itself firmly to the abdominal wall. After the organs were all freed, the median abdominal incision was extended upward to the ensiform cartilage.

Examination of the internal organs revealed very short and thickened greater and gastro-hepatic omenta; a shortened gastro-colic omentum and a very much shortened transverse meso-colon with both layers agglutinated, making the stomach and transverse colon absolutely immovable. An examination of the transverse colon, much to my surprise, showed it to be very little involved and only slightly thickened at the two points of adhesion and where the fistula was located. The whole anterior wall of the stomach however, was destroyed, and converted into a cauliflower appearance, with a black-grayish discoloration. It was diminished in size, there being less than two and a half inches square of normal but slightly thickened posterior wall.

The transverse colon reflected upward; the transverse meso-colon tied and cut off, and the unhealthy colon including the fistula was resected, the ends being united by sutures. After all the ligaments, adhesions and attachments were severed the stomach was next reflected upward and removed at the pyloric and cardiac ends, and the two ends united by the combined suture and Murphy button. The abdomen was closed with drainage.

The patient rallied and regained consciousness for a short time, but died five or six hours after the operation.

Comments. By examining the drawing, which is an exact likeness of the specimen, one marvels that vitality had been kept up for so long a time and that any food at all could be taken into the stomach. It was with much difficulty that a No. 15 English sound could be introduced from the cardiac to the pyloric end. The drawing shows the omentum and other tissues covering up the actual severed ends which are much shorter than the omental covering.

The facts that there was no pain in the stomach, and that large amounts of food were readily taken without distress, and that obstruction of the bowel was the only positive indication of malignancy, were what led to the error of diagnosis as to the organ involved. In the light of intelligence gained by operation, it proved that in the original gastro-colic fistula, the fecal material escaped through an opening into the gastric wall and thence externally, and later opened direct into the stomach. This explains why at first only the bowel contents escaped to the surface and later the gastric contents.

The obstruction of the transverse colon was produced by the very short meso-colon holding the colon rigidly, while it was pressed upon by the stomach above. It was only relieved by the opening of the fistulous tract, and the escape of the contents externally.

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JUNE, 1910.

THE FERMENT AND ANTIFERMENT TREATMENT OF CIRCUMSCRIBED SUPPURATIONS.

At the last Congress of the German Surgical Society, Professor Edward Müller of Marburg, an internist, published a new, physiologic treatment of suppurative processes—"a ferment and antiferment treatment." This is based on the relations of the proteolytic ferment of the polynuclear leucocytes and its antagonistic antiferment which latter occurs in the blood serum and in serous exudates. The pus corpuscles of acute suppuration being polynuclear neutrophiles are rich in this albumen-dissolving ferment, and thereby they cause destruction of tissue. Tuberculous pus, on the other hand, consisting chiefly of lymphocytes, appears to contain none of this proteolytic enzyme. By the addition of this ferment, artificially, Müller seeks to encourage resorption of tuberculous exudate; and, per contra, by introducing antiferment in acute or "ardent" suppurations he claims to inhibit the destruction of tissue by antagonizing the proteolytic enzyme of the pus cells. He believes that the good results of Bier's hyperemia depends in part on the artificial increase in the supply of antiferment.

The antiferment treatment can be derived from the use of human aspiration fluids, *e.g.*, from pleural and peritoneal exudates, but a supply of such serum cannot be either constant or sufficiently large for general use. An antiferment-containing serum may be derived from animals immunized by injections of human pus ferment, but this method Müller does not consider practical. In the course of recent cancer studies it has been learned that under certain conditions there is an increase of the inhibitory power of the blood serum against the proteolytic pancreatic enzyme trypsin. Müller's studies having indicated that the anti-tryptic power of the blood serum fluctuated with its inhibitory power against pus ferment, he has been using as his antiferment supply serum from animals immunized against pancreas trypsin.

The treatment consists merely in the evacuation of the pus by aspiration or by small incisions and injection into the cavity of the antiferment serum. The treatment is applicable only to circumscribed suppurations; it is not suited to infiltrating processes. Müller has seen good results from this method in the treatment of obstinate fistulae of the soft parts. He suggests its use to halt the destruction of cerebral tissue after opening a brain abscess, in the treatment of empyema, suppurative peritonitis, etc. (*Surgery, Gynecology and Obstetrics,* March, 1910). Gergö (*Deutsche Zeitschrift f. Chirurgie,* January, 1910) reported his observations on the antiferment-serum treatment in 160 cases. He commends it for localized suppurations, in which he says it effects quicker healing, easier after-treatment and better cosmetic results than incision. In no case did he see a serum rash or anaphylactic reaction. In the same issue of the *Zeitschrift,* Brüning reports the employment of "leukofermantin," or of hydrocele fluid, in over 100 cases. He, too, commends the method, but his observations appear far from critical. He records one death, which he attributed to anaphylaxis (injection treatments five months apart). David MacEwan recently reported (*British Medical Journal,* January 22, 1910) that he employed this treatment in 15 cases of localized suppuration with satisfactory results.

Since this treatment of suppuration is new and since, for the reason that the antiferment serum can be supplied commercially, it is entirely practicable, it is deserving of attention. But there have not been sufficient observations to establish the results of this "physiological therapy" or, indeed, its rationale. Indeed, M. Hirsch, of Vienna (*Berliner Klinischer Wochenschrift,* March 28, 1910) condemns it as unsound theoretically and useless clinically. In his hands the treatment of abscesses by puncture and antiferment injection was no more satisfactory than that by puncture alone.—W. M. B.

EXTRAPERITONEAL CESARIAN SECTION.

Operative obstetrics abroad has reached such proportions that many European teachers find it necessary in their lectures to instruct students separately on obstetrics as practiced in the hospital, and obstetrics in the home. To the classical Cesarian section have been added the vaginal Cesarian section, in order to overcome the resistance of the soft parts; pubiotomy, to enlarge the bony pelvis, and, lately, since pubiotomy has not satisfied the expectations of all, extraperitoneal Cesarian section.

Both pubiotomy and extraperitoneal Cesarian section aim to preserve fetal life in cases of suspected of, or already manifestly infected. The classical section, even the Porro, is attended with extreme danger in the face of fever and infection, in consequence of which obstetricians preferred to sacrifice the living child by perforation or embryotomy.

It seems that American obstetricians also might well consider the abvisability of performing extraperitoneal Cesarian sections in certain well selected cases. The results so far are encouraging, the technic has become fairly uniform, and the operation is far more controlable than pubiotomy.

As now practiced the technic described by Latzko appears to offer the best exposure with the least difficulty. Usually by incision through the left rectus muscle or by a transverse Pfannenstiel incision the prevesical space is exposed. The bladder is pushed downward and toward the median line, thus denuding a sufficient area of the cervix. The latter is incised vertically, sometimes in the median line, sometimes to the left of it. If the patient has been in labor for some time the lower uterine segment has become greatly thinned out and the bladder detatched. Through the incision the child is delivered, usually with one forceps blade acting as a lever, sometimes by the feet. The cervix is sewn and the outer wound is closed without drainage.

The chief advantage of this method is that the peritoneal cavity need not be invaded. The disadvantages are that the wound is large, complicated and opens enormous connective tissue planes, which may become the site of phlegmons. By this route the Fallopian tubes cannot be tied to induce sterility, and adhesion between the cervix and the abdominal walls may cause trouble in subsequent labors.

When the child's chance of survival has been greatly jeopardized by infection, excessive pressure, etc., it would still seem preferable to resort to embryotomy. In doubtful cases, however, or where special reasons accentuate the necessity for preserving fetal life, extra peritoneal Cesarian section deserves trial, especially as in pre-antiseptic days, it was first conceived on this side of the Atlantic. R. T. F.

ANNOUNCEMENT.

ARTICLES ON LOCAL ANESTHESIA.

We take pleasure in announcing for the July issue the first installment of a series of articles on local anesthesia by Dr. Arthur E. Hertzler, of Kansas City, whose recent publications on anesthesia by quinine injections are no doubt familiar. This series will run through twelve issues or more of the JOURNAL. It will cover the subject of local anesthesia in its various aspects—indications, limitations and technics; and it will be freely illustrated. We feel sure that it will prove of much interest and service to our readers.—W. M. B.

Surgical Suggestions

When attempting to loosen with a hook a foreign body almost or quite obstructing the auditory canal the passage of the instrument along the antero-inferior aspect of the canal involves the least risk to the drum membrane.

If a foreign body impacted in the auditory canal (especially if symptoms suggest that it has entered the middle ear) resists safe efforts at removal, administer narcosis, turn the ear lobe forward and open into the canal by a free incision from behind. This procedure, which is simple and leaves only invisible scars, is a very old one, but it is often forgotten.

When seeking the cause of an obscure or indefinite abdominal pain, and especially of a pain in the loin, making a careful microscopic examination of the centrifugalized urine. Renal calculi sometimes cause only mild, irregular pains, and the finding of a few red blood cells in the urine may be the first clue to their presence.

When a foreign body in the nose is not easily removable with forceps, remember Félizet's simple method—the injection of warm water into the opposite nostril. Use a syringe or douche nozzle that snugly fits the naris. Begin gently and slowly, then increase the force. As the resistance suddenly ceases, the foreign body is shot out (or at least is dislodged), by the pressure of the fluid reflected from the posterior wall of the pharynx.

Surgical Sociology

"The City Beautiful" has been much discussed, but not always in relation to the city useful. The devotees of this new and important phase of municipal life have failed to study the problem as it relates to hospitals, dispensaries, ambulance and emergency stations. Town and city planning of an intelligent character involves a full consideration of sites for all institutions caring for the sick and the convalescent. The relation of the location of such institutions to natural waterways, local topography, residential districts, factory districts, congested areas, parks, play grounds, schools, baths, and transit facilities warrants more consideration than does the purely ornamental side of town planning.

We call this phase of town planning to the attention of surgeons and physicians located in growing places now without hospital facilities. They should seize the opportunity of avoiding the errors that have been made all too frequently in the average large city of to-day. The article on "Coming Rural Surgery," by Dr. Edward Ayers, which appeared in the May issue of this journal, is of considerable interest in this connection.

Public health is undoubtedly the foundation of national health and national prosperity. Whatever tends to prolong human life serves to enrich the nation. The nation should be the greatest force to promote longevity. Is this government alive to its opportunity? An answer is near at hand in the action that will be taken by the United States Senate on the Owen Bill (6049), seeking to establish a "Department of Health under the supervision of a Secretary of Public Health to be appointed by the President as a cabinet officer." Under such a Department of Health, by systematic study, by carefully devised projects, by widespread educational plans, by uniform regulations, the preventable loss of 600,000 citizens and wards of the government each year would gradually be diminished until it could no longer be pointed to as an evidence of national carelessness and callousness.

In the throes of the Civil War, the Federal army sustained a total casualty of 359,528 from deaths in action, from septic wounds, from disease and from accidents. How small these figures of war look compared with the peace figures. One million five hundred thousand persons are destined to die in the United States during the year to come!

In 1906, Hoffman estimates, that there were 208,000 injured in accidents outside of mining, railroad or shipping circles. The Interstate Commerce Commission reported in 1907 that 11,800 persons were killed and 110,000 were injured on American railroads. Census Bulletin 83 reports 57,500 deaths by accident and violence in 1900. The railroads of New Jersey alone killed 1,830 and injured 18,555 of their own employees within ten years. In New York State the deaths from accidents are gradually becoming more of a scandal. From a rate of 53.3 per 100,000 in 1885 the horrible toll had risen to 107.4 per 100,000 in 1908. Why? How can it be reduced to a minimum? Who knows? Who should know? Let some government employee default with $1,700 and an investigation would soon be held and punishment visited upon the offender. Valuing a single human life at $1,700, what investigation is this government "for the people" making of the wholesale robbery of millions of dollars through the unnecessary and avoidable destruction of the fundamental asset of a nation—healthy citizens? What the government can do is manifest in the cleansing of Havana with its mortality rate from yellow fever of 428 per 100,000 in 1897 until there were no fatalities in 1902. With governmental backing Col. Gorgas has turned pest-ridden Panama into a district as healthful as New York City. Senator Owen has well said:

"Why conserve coal fields and not coal miners. Why conserve plant life and not human life. Why conserve animal life and not child life."

The duty of every physician and surgeon is clear. The Owen Senate Bill (6049) has the approval of the Committee on Legislation of the American Medical Association and is supported by the Committee of One Hundred on National Health. Write your Congressman and Senator asking them to study the bill, appreciate its merits, and support it that it may become a law.

Blinding, crippling, killing hardly seems the most rational method of encouraging civic pride; $20,000,000 are spent in the United States on fireworks to celebrate each Fourth of July, and to what end? From 1903 to 1907, 1,153 persons were killed and 20,520 were injured. In 1908, 163 children were killed and 5,460 were injured. In 1909 215 children were killed. The Glorious Fourth! Such a fatality from any other cause would provoke harsh criticism and corrective measures. Properly conducted, fireworks *displays* at night are a pleasing and not inappropriate form of celebration. But what have pistols, toy cannons, and giant crackers to do with pyrotechnics!

The campaign for a sane Fourth of July, started eight years ago by *The Journal of the American Medical Association*, and waged by that journal and various medical and lay publications, is at last bearing fruit! In New York City, a new kind of mayor, whose public acts during the few months of his incumbency have worked more good than many of his predecessors accomplished in their entire terms, has found it worth while to execute a written law and, by his order, no fireworks will this year be sold in the metropolis between June 10 and July 4. Other municipalities, including Washington, D. C., have gone still further in providing appropriate patriotic exercises and sports by which the Fourth of July can be celebrated, and which children will enjoy at least as much as shooting one another. Besides the relief from unnecessary fires, these sane celebrations will cause re-

joicing at hospitals, because of the absence of the usual noise, and of the ambulance activity. Peace will reign instead of war; more patriots will survive to rejoice again next year.

In those communities where pistols, cannons, bombs and fire crackers will still be exploded, the fire engine, the ambulance and tetanus antitoxin will again be in demand; and when the day's din is silenced there will arise the groans of the injured and the wails of mourners—the dirge of an inglorious Fourth!

Modern surgery owes no small part of its present greatness to the development of efficient trained nurses. Our congratulations go over the seas to Miss Florence Nightingale, age 90 years, who just fifty years ago founded the Nightingale School for the Training of Nurses in St. Thomas' Hospital, London. To her must be given all honor as the mother of the modern sanitary nurse. To-day we can better appreciate what she expounded 50 years ago: "In surgical wards, one duty of every nurse certainly is *prevention*."—I. S. W.

Book Reviews

Urgent Surgery. By FÉLIX LEJARS, Professor Agrégé à la Faculté de Médicine de Paris; Chirurgien de l'Hôpital Saint-Antoine. Translated from the *sixth French edition* by WILLIAM S. DICKIE, F. R. C. S., Surgeon, North Riding Infirmary, Middlesbrough; Consulting Surgeon to the Middlesbrough Union Infirmary and to the Eston Hospital. VOLUME I. Large octavo; 617 pages; 994 illustrations and 20 full-page plates. New York: WILLIAM WOOD & Co., 1910. Cloth, $7.00 net; half morocco, $8.00 net.

Various books have appeared, under different titles, dealing with "emergency surgery." Lejars' "Chirurgie d'Urgence," a standard since the appearance of its first edition eleven years ago, is the best of these; and Dickie has performed a creditable service in translating into English from its latest (sixth) French edition, a work that has already appeared in German, Italian, Japanese, Spanish, Russian and Hungarian.

In stating that this is the most comprehensive as well as the best of the works on urgent surgery, it is only fair to the others to admit that some of them stick more closely to their text. Lejars is hardly justified in including in "Urgent Surgery" the open operation for fracture of the lower jaw. And how often are enucleation of the eye, esophagotomy for foreign body, drainage of a mediastinal abscess so urgent that they cannot be delayed until a skilled surgeon is secured? To be sure, this depends upon the remoteness of the community in which the necessity arises, and, in order that Lejars' work should be, as, indeed, it is, useful as a reference to practitioners distant from trained surgical help, he cannot be condemned for including all the emergencies that may arise. Moreover, as Lejars says, "those who are not operators themselves should at least know something of the details of the operation," and "urgent surgery does not mean merely the surgery of injuries . . . the number of clinical conditions demanding immediate surgical action is very great."

This, the first volume, covers the urgent surgery of the head, the neck, the thorax, the spine and the abdomen. If the diagnoses and treatment of these conditions were described in a cut-and-dried fashion this work would offer the reader nothing that he cannot get from other textbooks. It is the manner in which the subjects are presented that gives this treatise its unique character and makes it eminently useful. Lejars has filled it with practical directions and with useful "wrinkles." He has infused into it, in short, his individuality and his own experiences in emergency surgical conditions. Especially, he has not only avoided unnecessary discussions and a confusion of methods, but he has laid down tersely and unequivocally the indications for each set of conditions and the operative technic where operation is called for. The little things that may arise during an operation, what one should not do, as well as what one should—the details which other surgical works pass over as more or less elementary—are set down at length. Lejars addreses his readers in a sort of heart-to-heart manner that makes his book not only interesting reading, but invaluable to the novitiate.

It is fortunate that the translator has so well succeeded in catching the spirit of the author's text. Indeed, so desirous was Dickie to preserve all of the original to its English readers that he has introduced only as foot-notes his own many and useful additions. It would have made the reading somewhat easier if these notes had been inserted in the text between brackets.

In addition to the sections above mentioned this volume contains an introductory section on the preparation for an emergency operation, sutures, dressings, anesthesia, saline infusion and phlebotomy. The preparations for operation "with complete lack of necessaries" are described very tersely and clearly. These pages might have included, as Lilienthal did in his "Imperative Surgery," suggestions for improvising certain surgical instruments and accessories from household articles; and Dickie might have added that the most satisfactory hasty skin disinfection is by tincture of iodine.

This translation is one of the most useful additions to recent surgical books in English. We await with interest the appearance of the second volume.

Diseases of the Genito-Urinary Organs. Considered from a Medical and Surgical Standpoint, including a Description of Gonorrhea in the Female and Conditions peculiar to the Female Urinary Organs. By EDWARD L. KEYES, JR., M.D., Ph.D., Clinical Professor of Genito-Urinary Surgery, New York Polyclinic Medical School; Surgeon to St. Vincent's Hospital, New York; Lecturer on Surgery, Cornell University Medical School; Octavo; 975 pages; 195 illustrations and 7 plates (4 in colors). New York: D. APPLETON & Co., 1910.

In this book of nearly a thousand pages the younger Keyes has presented not only a modern and sufficiently comprehensive consideration of venereology and the diseases of the urinary tract in their various aspects—diagnostic, therapeutic, psychologic, sociologic—but what is even more creditable, a work of distinct and distinctive quality. Two features, especially, contribute to its excellence—a charming literary style, quite unusual in medical text-books, and pedagogic judgment, both in the arrangement of subjects and in their presentation. The first section, devoted to the Principles of Urology, deals with Physical Examination, Urinalysis and Instrumentation. The technic of asepsis is one of the keynotes of this section. Dr. Benjamin Barringer contributed the chapter on cystoscopy and ureter catheterization. It is an altogether excellent description of several of the modern cystoscopes and their employment, illustrated by pen and water color drawings done by Barringer.

The second section is devoted to a detailed description of gonorrhea. It sets out with a short history of its social aspects—a subject to which the author has elsewhere contributed—and, continuing with a description of the gonococcus, it proceeds to a consideration of almost every phase of the disease. In regard to treatment, the author clearly states his preferences, but he does not hesitate to mention, critically, other methods now in vogue. It is of interest that he expresses a sane conservatism in the management of chronic urethritis, and inveighs against over-treatment. The chapter on Gonorrhea in Women, by Dr. Emily Dunning Barringer is skilfully handled, but it

seems to us too brief. However, considering that it is somewhat of an innovation in a book of this kind, brevity may have been a purpose. In the third section are considered the diseases of the urinary organs—urethral stricture, affections of the prostate, bladder, ureters and kidneys. In the discussion of calculus, injuries, tuberculosis, and tumor, Keyes has broken away from the old anatomical classification, and has presented these conditions as they affect the urinary tract, considered as a whole. Pathologically and pedagogically this is the better arrangement. Congenital abnormalities are placed at the end of the section, rather than at the beginning—again a departure from a scheme more ancient than useful. In passing, we would commend Keyes' dignified and happily phrased comments on functional sexual disorders.

Syphilis, most often a genital infection, deserves description in such a book as this, but being a systemic disease, Keyes properly avoided making this section voluminous. A little less than 100 pages are given to this disease, of which ten are devoted to hereditary syphilis. The Wassermann and Noguchi tests are referred to, but their technics are not described.

The final section, about 150 pages, on Operative Surgery, gives an account of most of the important operations on the urinary tract, without going into detailed description of the technics, to which an entire book could be devoted.

Vasectomy is only briefly mentioned. Considering its present sociologic interest it might have been discussed from that point of view.

The book is printed on heavy coated paper, which would have warranted better illustrations and mechanical make-up. The photographs do not show up very clearly, especially those demonstrating the introduction of sounds and instillation. Some of the new line drawings are crude and those which are copied from older text-books look out of date. The index is ample.

We commend this work warmly. It is authoritative, comprehensive, interesting!

Emergency Surgery for the General Practitioner. By JOHN W. SLUSS, A. M., M. D., Professor of Anatomy, Indiana University School of Medicine; formerly Professor of Anatomy and Clinical Surgery, Medical College of Indiana; Surgeon to the Indianapolis City Hospital; Member of the National Association of Military Surgeons; *Second Edition,* Revised and Enlarged, Duodecimo; 748 pages; 605 illustrations; Flexible Leather. Philadelphia: P. BLAKESTON'S SON & CO., 1910. Price, $3.50.

The rapid exhaustion of the first edition of this book, especially prepared for the general practitioner, is both an indication of the demand for such a work and very significant of the broadening of the scope of the general practitioner. Unquestionably, a careful study of the volume will go a very long way towards preparing the physician not specially skilled in surgery to meet emergencies as they arise. In addition, the book is so arranged that one can, in a short space of time, read up the subject in which he is particularly interested at the time, without reading preceding chapters.

The author has added a chapter on the general technic of laparotomy and additional sections on such subjects as pericardiotomy and subphrenic abscess. He has inserted numerous illustrative cases culled from the literature, which elucidate many points in technic. We find too great a tendency, however, towards the insertion of what might be called "diagnostic hints." They appear to us to be out of place in a treatise of this nature; or, if the author wishes to insert them, they should be more complete. The vast majority of the operations advised are standard ones, but here and there he describes operations about which there is not, as yet, unanimity of opinion. For example, we do not think that the operation of subtemporal decompression for fracture of the base of the skull is at present generally employed or its efficiency fully proven.

For all that, the book is a very valuable one for the large group of medical men for whom it has been written, full of valuable suggestions not only for that group, but also for the trained specialists who do not have the opportunity to see much accident surgery.

Preparatory and After-Treatment in Operative Cases. By HERMAN A. HAUBOLD, M. D., Clinical Professor in Surgery and Demonstrator of Operative Surgery, New York University and Bellevue Hospital Medical College, New York; Visiting Surgeon Harlem and New York Red Cross Hospitals, New York, etc. Octavo; 650 pages, 429 illustrations. New York and London: D. APPLETON & COMPANY, 1910. Price, in cloth, $6.00.

In his introduction, the author expressly states that his object in writing this book is that of educating the general practitioner in the preparation of patients for operation and in their after-treatment. He points out that the general practitioner is in an unenviable position to-day in relation to the treatment of surgical cases because he has not kept in intimate enough touch with modern methods of pre- and post-operative care of major surgical conditions.

In the first part of the book, Haubold deals with the detailed description of the preparation of the patient; the methods of preparation and of sterilization of instruments, dressings, and suture material; the preparation of the operator and his assistants, and of the operating wound. He then takes up the material employed in, and the methods of drainage, of suture and of dressing of wounds. The immediate post-operative complications—such as shock, secondary hemorrhage and acute dilation of the stomach—are then described, together with their treatment. In addition, what might be termed the "normal" post-operative phenomena are described and methods of treatment presented.

The second part of the work describes the methods of preparation and the after-treatment of the special types of operation, thus: Operations on the scalp, skull and brain, operations on the abdomen, operations on the extremities, etc.

The author's style is simple, clear, and readily understood, but his phrases are not always couched in good English. Some of his methods are from his own experience, some from other observers; in the former there is a tendency towards unnecessary dogmatism. Not everyone will agree, for example, that Kumyss or Matzoon should be given as soon as post-operative nausea has disappeared. In a careful inspection of Haubold's book, we find but one serious misstatement. He describes the "postural treatment for acute dilation of stomach and intestine, following operation" as the elevation of the head of the bed. From our present knowledge of this condition such a posture would unquestionably be harmful in many cases. It is the *foot* of the bed which should be raised, and the illustration (page 281) should therefore be corrected or removed.

In the main, then, the book is a good one and, despite its bulkiness, can be recommended to the general practitioner. The illustrations are good, but those in the first part of the book give it almost the appearance of a catalogue of hospital furniture.

Der Chirurgische Operations Kursus. Ein Handbuch für Aertze und Studierende von PROF. DR. VICTOR SCHMIEDEN, Privat dozent der Chirurgie an der Universität Berlin, Assistant der Königl Chirurgischen Universitätsklinik. Octavo; 327 pages, 354 illustrations. Leipsic: JOHANN AMBROSIUS BARTH, 1910.

Nothing but praise can be given to Schmieden for this work on operative surgery on the cadaver. It consists of an illustrated description of the course in operative surgery given by him. He makes no attempt to describe all the operative methods, but confines himself to the standard operations as they are practised in the University Clinic. His style is succint and clear, the complete phraseology so often seen in German medical works being noticeably rare. The illustrations are for the most part in color, and are works of art. The book is an excellent guide, both for students and for practitioners, to surgery on the cadaver.

Progress in Surgery

A Résumé of Recent Literature.

Transfusion in Pellagra. With Report of Cases. H. P. COLE and GILMAN J. WINTHROP. *The Southern Medical Journal.* February, 1910.

The authors worked on the following principles: 1. Pellagra is an intoxication; 2, the toxic principles of pellagra exist in the blood of pellagrins and will produce pellagrous symptoms when transferred to other animals; 3, pellagrous serum exhibits definite precipitative hemolytic and antitoxic properties; 4, an artificial immunity can be produced in animals and exists in cured pellagrins.

The first cases were transferred merely to relieve the anemia in pellagra. They were further enabled to perform a transfusion in a severe case of pellagra, using a cured case of pellagra as the donor. This first case is worth reporting:

Four days after the transfusion the patient has improved markedly and walking about the ward. This patient went on to a rapid recovery. She has presented no symptoms of the disease since the operation performed fourteen months ago. The recovery in this case was so immediate and complete as to be extremely suggestive.

The difficulty of securing cured cases as donors has forced the operators to employ normal, healthy individuals in a number of transfusions. They chose these non-pellagrous donors from among persons living in the same surroundings, eating the same food and subject to the same chances of infection as the patients themselves. It is possible that these donors have developed a certain amount of immunity and contain antitoxic bodies in their blood.

It must be noted that the only medicinal agents used, in the recovered cases, were tonics of strychnine, forced feeding, and in some cases carbonate of iron.

In every case benefited by transfusion the improvement was immediate, as shown by marked gain in weight within the first week, in one instance as much as eight and a half pounds. All the patients, two months after transfusion, are either apparently cured or markedly improved, and have gained from 15 to 34 pounds in weight.

Of the fatal cases, one was moribund at the time of operation and died three hours after transfusion; another received no appreciable amount of blood on transfusion; a third received practically no blood at the first operation, and at the second operation, when a pellagrous donor was used, while she received a good flow of blood, her condition was hopeless.

The authors suggest the following conclusions:

(1) Transfusion offers a means of combating the anemia, stimulating the recuperative functions and perhaps of furnishing antitoxic substances to pellagrins.

(2) The lessened mortality and marked improvement in transfused pellagrins leads us to anticipate the establishment of a serum therapy in the disease.

(3) Transfusion may be offered as a surgical therapeutic procedure in pellagrous cases pending the perfection of a successful serum therapy.

On the So-Called Essential Hematurias (Sur Les Hematuries Dites Essentielles). ROBINSON AND JACOULET, Paris. *Revue de Chirurgie,* April, 1910.

From a study of a large series of cases the authors conclude that the existence of hematuria not associated with lesions in the kidney is unquestionable. The finding of sclerosis of the organ in such cases is to be considered the result and not the cause of renal congestion. The causes of these essential hematurias are to be sought in vasomotor changes, in endogenous intoxications, in changes in the liver, etc.

Medical treatment is, in general, sufficient to control the hematuria of this class of cases. In severe cases, the exception, nephrotomy, should be performed, to be followed by suture of the organ. Nephrotomy seems to have a double action—to diminish congestion, and to partly cut off the arterial influx by obliteration of the bloodvessels. The function of the kidney seems in no wise to be interfered with by the operation of nephrotomy and suture.

The Treatment of Common Warts, Clavus and Callosities with Carbon Dioxide Snow. (*Die Behandlung der gewöhulichen Warzen, des Klavvs und Tyloma mit Kohleusäureschnee.*) J. FABRY & ZWEIG, Dortmund. *Müncheuer Medizinische Wochenschrift,* March 29, 1910.

The advantage of carbondioxide snow lies in the fact that warts, corns and callosities may be removed without operation, prolonged treatment or much pain, and that no scar results. The snow is obtained by fastening a leather pouch tightly about the outlet of a carbon dioxide pressure cylinder and allowing two or three puffs of the gas to escape. The snow is shaped into pencils by pressing it through a glass syringe without a needle. The application, which may be made with some pressure, is continued from twenty to fifty seconds (less in youthful, more in aged individuals). With warts the area treated should be about double that of the wart. The nearer to the finger tip the more painful the treatment. In about twenty-four hours the wart will be found free from the underlying skin at the apex of the bulla. The vesicle is now excised, and the raw surface, which is formed by the papillae of the skin, is dressed with a bland powder. In keratosis palmaris it may be necessary to treat fifteen to twenty spots at one or more sittings. The large vesicle, covering the entire sole of the palm, is then excised. By this simple method prompt and permanent results may be obtained.

A Case Illustrating a New Operation for the Closure of the Mastoid Wound by a Muscle Flap. SAMUEL IGLAUER, Cincinnati. *The Lancet-Clinic,* April 16, 1910.

The incision was prolonged upward and then forward into the scalp, which was dissected free from the posterior portion of the underlying temporal muscle. The exposed muscle tissue with its overlying fascia was freed from the cranium and split parallel to the muscle fibers, thus forming a muscle flap, with its base under the zygomatic arch. This flap was then rotated downward and backward and was implanted into the mastoid wound, where it was held in place by catgut sutures fastened to the periosteum at the posterior margin of the wound. A drainage tube was introduced into the antrum and gauze was packed around the tube. A counter opening was made through the scalp over the defect corresponding to the original site of the muscle flap and a small tube was introduced here. The original incisions were closed with silkworm gut, except in the region about the drainage tube.

The subsequent course was uneventful, except for a slight edema of the left eyelid and for a hematoma, which formed under the scalp. The drainage tube was removed from the mastoid on the third day and the discharge from the meatus ceased by the seventh day. The skin incisions closed by primary union. The discharge from the mastoid wound ceased by the eighteenth day, and the child left the hospital on the twentieth day with the wound entirely healed. The cosmetic result is perfect, since the mastoid process has its normal contour and the extra incisions are covered by the hair. The plastic operation also undoubtedly greatly shortened the time of the after-treatment.

Varicocele: An Analysis of 403 Cases. J. D. BARNEY, Boston. *Boston Medical and Surgical Journal,* March 17, 1910.

The vast majority of the cases occurred between the ages of 20 and 25. Eighty-one per cent. of the patients were single. In 8 per cent. the disease existed from birth. The left scrotum was affected in 90.5 per cent. of the cases; in 8 per cent. both sides were involved, and in only 1 per cent. was the right scrotum the seat of the affection. The principal reason for which relief was sought was pain (270 out of 403). Thrombosis and phlebitis were noted in 13 of the cases; and the varicocele was associated with mental symptoms of varying grade in 9 per cent. In 11.5 per cent. the testicle was atrophied. The author does not

believe that the varicocele explains the atrophy in every case. He believes that in many instances the testicle is congenitally undeveloped. No distinct eteological factor was determined in the author's series of cases, but the larger percentage (15 per cent.) in which other congenital malformations were present is significant in the author's mind as indicating a tendency to congenital abnormalities. Credence is given to this view by the fact that in 4.3 per cent. varices occurred in other parts of the body. In order to determine the end results of operation, the author could follow only 39 cases. In all these cases the radical operation of excision was performed. Thirty-six per cent. still complained of tenderness in the testicle or groin. In 27 per cent. sexual hypochondriasis was still present. No definite proof could be adduced to determine whether the undeveloped testis retained its normal size or function. Recurrence was found in 6 per cent. The author concludes: "1. We must discard the old ideas of the mechanical origin of varicocele and lay greater stress on its being a congenital defect or overgrowth. 2. The so-called radical operation is by no means universally successful and in most cases can be advantageously supplemented by a course of psychic spouts such as most physicians use in their daily routine."

The Treatment of Empyema, Pleuritic Effusion and Hydrocele with Sodium Bibarate Solution. J. P. ESCH, Daytona Beach, Fla. *Journal of the American Medical Association,* March 26, 1910.

Esch reports three cases. The first was a child of 10 who required seven aspirations for empyema. After each aspiration the chest filled with pus. After the last aspiration, the author injected a pint of 2 per cent. solution of biborate of soda at a temperature of 100° F., and allowed the solution to remain ten minutes. The patient made a rapid recovery. The second case was one of pleurisy with effusion; the same procedure resulted in a perfect recovery. The third patient was an old man of 70, whose hydrocele had refilled after three aspirations. After washing out the sac with sodium biborate solution, the hydrocele no longer recurred.

On the Application of the Continuous Stomach Drainage in the After-Treatment of Severe Peritonitis Cases. (*Uber die Anwendung des Dauermagenhebers hei der Wachbehandlung schwerer Peritonitisfälle.*) C. W. J. WESTERMAN Haarlem. *Zeutrablatt für Chirurgie,* March 5, 1910.

The author inserts a thin stomach tube through the nostril into the stomach and allows the proximal end to empty into a receptacle. The pharynx is previously cocainized. The contents of the stomach flow out through the tube as soon as they accumulate and vomiting does not occur. Westerman believes that he prevents considerable auto-intoxication by this procedure, and at the same time, the necessity of washing the stomach (a severe operation in these patients) is obviated. The use of this method in the author's hands has proven very satisfactory.

Clinical Experience with the Wasserman Reaction in the Johns Hopkins Hospital. PAUL W. CLOUGH, *Johns Hopkins Hospital Bulletin,* March, 1910.

In 99 cases where syphilis could be excluded the reaction was negative in all. In 51 doubtful cases in which clinically syphilis was not probable, the reaction was positive in 4; in 50 in which syphilis was probable, positive reaction was obtained in 66 per cent. In 45 cases which were certainly syphilitic, a positive reaction was obtained in 73 per cent. Excluding cases which had recently received mercurial treatment, positive reactions were obtained in about 82 per cent of the cases showing active syphilitic lesions. Positive reactions were obtained in 40 per cent. of 15 cases of tabes, and in all of the 7 cases of general paresis.

The Dyspeptic Type of Chronic Appendicitis, with Differential Diagnosis. C. GRAHAM, Rochester, Minn., and D. GUTHRIE, Sayre, Pa. *Journal of the American Medical Association,* March 19, 1910.

Graham and Guthrie have studied that form of chronic appendicitis in which dyspeptic symptoms predominate. They have reviewed carefully the histories of about 200 patients and compared them with histories of ulcer of the stomach and duodenum and gall-bladder disease. In chronic appendicitis in which gastric symptoms predominate, we find a neurotic element in many cases. The patients are usually younger than those with chronic ulcer or gall-bladder disease. The symptoms are irregular as compared with chronic ulcer and prolonged when compared with gall-bladder trouble. The pain is the great symptom during an attack. It often appears after eating. Nausea, distress, flatulence, and a feeling of distention cover the sensations of far more patients with appendicitis than those with ulcer or gall-bladder disease. Location has some bearing, though in all three conditions it may be only epigastric. Here, however, it is often indefinitely epigastric and abdominal. A tender area is often found at McBurney's point, though not complained of subjectively. Food gives no relief, as in ulcer, and anything taken into the stomach usually causes more or less distress. The authors consider the common "belly ache" of children as typical appendicitis and a forerunner of later dyspeptic types. Constipation is one of the early symptoms and may be the only one for a considerable period, and discomfort from gas makes more of the general trouble than it does in ulcer and is referred to by the patient as abdominal largely and is relieved by expulsion. The treatment will hardly bear discussion. In ulcer we have medical cases in the majority, and in gall-bladder disease we may be justified in advising medical treatment, but any advice other than that of recourse to surgery is out of place in chronic appendicitis. In many cases, one can only say that there is a serious trouble in the abdomen, and, if the upper abdomen is found normal on operation, look for appendicitis.

Ether: An Antidote of Havain and Cocain Poisoning J. E. ENGSTADT, Grand Forks, *Journal of the American Medical Association,* March 19, 1910.

Engstadt found the action of strychnin and morphin, as antidotes to cocain, too slow, and it was necessary to find something that would counteract the poison more rapidly when life was in danger. He found this drug in ether administered as ordinarily to produce surgical narcosis. While cocain inhibits the action of the heart, especially on the right side, and effects also the superior respiratory centers, ether properly given has the opposite effect and has saved what seemed to him hopeless cases. To get the best results it is administered only to the degree of mild surgical narcosis, or even less. A mask should be employed and the ether given by the *drop method.* This, he thinks, is all important.

Bladder Hemorrhages from Varicosities. (Über Varicöse Blasenblutungen.) J. VOGEL, Berlin. *Berliner Klinische Wochenschrift,* April 25, 1910.

The author reports four cases of this interesting malady. Varicose veins of the bladder are more common in women. (Three of the author's four cases occurred in this sex.) They are usually the result of a pelvic stasis due to the presence of para—or perimetritic processes or of large tumors. They are particularly liable to be associated with pregnancy. The symptoms are not characteristic. The hemorrhages are usually large and are followed by intervals when the urine is normal. Pain is always absent. The only positive means of diagnosis is by the cystoscope. Treatment consists merely in rest, in applications and stypticin. In some instances, the injection of 2% gelatine may be tried. In none of the author's four cases were other measures necessary.

A New Method of Intravenous Treatment of Varicose Veins of the Lower Extremities. (Ein Neues Verfahren der Intravenösen Behandlung der Varicositäten der Unterextremitäten.) P. SCHARFF, Stettin, *Berliner Klinische Wochenschrift,* March 28, 1910.

In order to cause thrombosis of the veins, the author recommends an intravenous injection of bichloride of mercury in normal salt solution of 1-5000 strength. The injections are made with the patient in a standing position after a ligature has been applied to the thigh. The injec

tions are made in the prominent parts of the veins, and from three to eight injections are made at one sitting. The author recommends initial doses of ½ c.c., which are gradually increased in strength until even 5 c.c. may be used at each injection. If these are well borne a 1-3000 solution is injected in the same way. The injections are made at intervals of from 3-6 days. The author's experiences are based upon 90 cases and are highly satisfactory. In only one case was an untoward result obtained. This was the production of a slow-healing ulcer and was due to the injection of a larger dose than he was commonly in the habit of employing.

Varicocele: Its Pathology with Reference to the Soldier and a New Operation for Its Relief. G. M. BLECH. *The Military Surgeon,* May, 1910.

The author believes that all soldiers suffering from symptoms of varicocele should be operated upon instead of temporizing with trusses, etc. He advocates the following operation: An incision, about one inch in length, is made beginning at the external ring of the inguinal canal extending downward and over the course of the cord. The cord is thoroughly exposed, but the enveloping membranes are not incised. The cord is gently pushed toward the inguinal canal and into it until the scrotum is elevated to the lower angle of the wound. Silk or catgut threads are now passed through the tunica propria—two should suffice—at a point say half an inch above the testicle and the needle reinserted and passed through the aponeurosis of the external oblique and the sutures tied. The external wound is closed in any manner desired. Some attention should be paid to the vas deferens, to see that it does not become kinked. The author operated upon three cases over one year ago by this method with excellent results.

Researches on Hemostasis in Brain Operations and on the Closure of Dural Defects. (Versuche über blutstillung bei Gerhirn-Operationen und Duraplastik.) E. UNGER and M. BETTMAN, Berlin. *Berliner Klinische Wochenschrift,* April 18, 1910.

The portion of this paper which possesses real merit is that relating to the closure of dural defects. For this purpose the authors recommend portions of the vena cava. They excised portions of the dura in dogs and covered the defect with the bloodvessel, endothelial surface downward. The vein is kept in place by a few superficial sutures. Either a fresh vein or one that has been kept on ice may be used. In every instance the graft healed in situ and did not produce adhesions to the brain.

A Skin Reaction in Carcinoma from the Subcutaneous Injection of Human Red Blood Cells. CHAS. A. ELSBERG, HAROLD NEUHOF and S. H. GEIST, New York. *American Journal of Medical Sciences,* February, 1910.

Based upon the well known observations that the serum of cancer patients possesses hemolytic properties *in vitro* in a large percentage of the cases, Elsberg conceived the possibility that this hemolytic test might show a higher specificity if conducted under more normal conditions in the suspected patient. For this purpose he injects a 20% solution of washed normal human red blood corpuscles beneath the skin of the arm of the suspect. A positive hemolytic reaction is evidenced by a peculiar color of the overlying skin, varying from a brownish red to a maroon, with rarely a bluish tinge. With this change in color there is a slight elevation of the skin. The reaction usually appears within five hours, but may vary between two and eight hours, and disappears, on the average, 6 to 12 hours after the injection. The authors report their observations upon 684 injections in 432 patients. Of 69 undoubted carcinoma cases, the reaction was positive in 89.9%. Of 325 non-carcinoma cases, the reaction was positive in 4.6%. In 9 cases of possible carcinoma, the reaction was positive in 77.8%. In 11 cases of very advanced or miliary carcinoma, the injection was negative.

For the detailed method of performing this reaction, the reader is referred to the original paper.

A Comparative Study of Hemolysis in Vitro and in Vivo as a Means of Diagnosis of Carcinoma. ARTHUR KRIDA, Albany. *Albany Medical Annals,* May, 1910.

Using the Elsberg subcutaneous injection of blood as an hemolysis test for carcinoma, the author found it positive in 9 out of 12 cases. In four cases of carcinoma without clinical recurrence the reaction was negative. The reaction was positive once in 23 cases of miscellaneous disease and was negative in 25 clinically well patients. The author concludes that this method is of corroborative value in suspected cases of carcinoma.

An Epidemic of Noma. HAROLD NEUHOF, New York. *American Journal of Medical Sciences,* May, 1910.

The epidemic consisted of eight cases, all of which followed measles. From his experiences, the author derives the following conclusions: Noma usually appears in epidemic form; its contagiousness has not been proved. There is regularly present in noma a streptothrix characterized by a thick meshwork of mycelium at the border line between normal and necrotic tissue; fine rods and spirilla extend from mycelium into the adjacent tissues. The constant presence of the streptothrix, to the exclusion of other organisms, indicates that, in all probability, it stands in direct relationship to noma. The streptothrix is present in noma before the disease is fully manifest—in the pregangrenous stage. It is in this stage of the disease that radical treatment is to be practiced; after the ulcer spreads, the best results are obtained by conservative measures. General anesthesia should not be employed in any form of treatment because of the pronounced tendency to the development of septic pulmonary disease.

Pain in the Ear and Its Diagnostic Significance. J. GORDON WILSON. *Quarterly Bulletin of Northwestern University Medical School,* March, 1910.

The author divides the subject into three parts and classifies pain in the ear as follows:

1. Pain located in the ear or in the anterior part of the auricle is associated with the auriculo-temporal nerve. It often is centered over the upper anterior part of the auricular attachment. During exacerbations it may radiate over the temporal distribution of the nerve, or, less frequently, overflow into some other branch of the mandibular nerve (third division of the fifth). Such pain may be due to acute inflammation of the membrana tympani, acute inflammation of the external auditory meatus, irritation due to foreign bodies, especially to insects, herpes oticies and disease of some neighboring part such as the teeth, the tongue, the pharynx, the larynx and nose.

2. Pain in the mastoid region may be deep-seated and associated with irritation of the mastoid branch of the tympanic nerve, a branch of the glossopharyngeal. If superficial the nerves primarily involved are the auricularis magnus and the auricular branch of the occipitalis minor. Since inflammation of the mastoid cells reacts quickly on the superficial structures, we find that in acute mastoid disease the pain, though at first deep-seated, soon becomes diffused over the head and neck. There are three well defined areas of sensory intensity in mastoid disease; (*a*) over the antrum, just below the temporal line; (*b*) over the tip of the mastoid; (*c*) less commonly on the posterior wall of the mastoid. Pain over the mastoid occurs in acute otitis media, in acute purulent inflammation of the mastoid, in acute inflammation of the mastoid glands, in herpes of the auricularis magnus and occipitalis minor nerves, and also the pain may be referred by glandular enlargements in proximity to these nerves and from irritations of the roots of the nerve as in caries of the cervical vertebra.

3. Deep-seated pain in the ear, so far as it can be dissociated from similar sensations involving the fifth cranial nerve, involves as a rule the glossopharyngeal nerve. It occurs in acute otitis media and in inflammation of the pharynx, especially in peritonsillar inflammation.